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ABSTRACTS OF TUBERCULOSIS

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General Care of Surgical Tuberculosis.—The typical victim of "surgical" tuberculosis is the child and the first effort therefore should be to prevent childhood infection. Even after the tubercle bacillus has gained ingress, it will usually become effectively incarcerated if the child is given sufficient and proper food, air and exercise. Once the first vague symptoms appear, the physician should seek a consultation and opportunities for such consultation should be made simple and easy. If definite bone or joint or other involvement is proved, treatment should be hastened. Promptness in this respect will restore health and function in most cases, whereas delay means pain. illness, crippledom and death. Cases are cited to prove this. After-care must be provided for discharged cases. For this purpose and for the recognition of early disease a scheme that has proved useful is the establishment of a central hospital and scattered local clinics supervised by the staff of the central hospital. In England necessary legislation has been enacted to enable the Ministry of Health and the local authorities to provide proper machinery to detect and treat all cases.—*Team Work in the Treatment of Surgical Tuberculosis, G. P. Girdlestone, Brit. J. Tuberc., April, 1922, xvi, 66.*

Operative Treatment of Surgical Tuberculosis.—Indications for radical operation in surgical tuberculosis are the following: 1. Well-defined, firm, movable, discrete tuberculous nodes of the neck or axilla. 2. Small cold abscesses of the thorax with or without rib tuberculosis. 3. Tuberculosis of the tendon sheaths especially when caseation and liquefaction of their contents occurs. 4. Bone foci demand operation when the roentgen rays show sequestration. 5. Circumscribed paraärticular foci of the bursa, especially when it is feared that they will break through into the joint. 6. Resection of the knee joint is indicated in adults when the process is painful and runs a protracted course, and does not submit to rest and fixation. 7. Amputation is generally resorted to only in cases in which there occurs a mixed infection. Purely tuberculous processes usually submit best to conservative treatment.—*Neue Richtlinien in der Therapie der chirurgischen Tuberkulose, M. Jerusalem, Wien med. Wchnschr., June 4, 1921, lxxi, 1008.*

Effect of Altered Intrathoracic Pressures Following Artificial Pneumothorax.—It is now recognized that any change in the pressure in one pleural cavity will affect the other one almost equally. There is an exception to this rule when the pneumothorax is localized by adhesions, or the mediastinum effectively fixed, or both. In such an event high positive intrapleural pressure of from 30 to 40 mm. of mercury are withstood without any effect on the opposite lung; occasionally, but not frequently, this high pressure causes adhesions to rupture. While no standard optimal pressure can be set, it is generally observed that the best results are more frequently obtained when the intrapleural pressure can be mainained at about −2 to −3 cm. of water. In case the mediastinum is flexible this pressure may lightly compress the opposite lung which, if diseased, may be benefited by the partial collapse. But if the pressure is too rapidly increased the untreated lung is crowded and must overcome this altered relation by more strenous inspiratory effort, when the result may be deleterious in reactivating the lesion in this lung. Slight positive pressures may be necessary to

control bleeding from thick-walled cavities but, even in this emergency, a high pressure is not always necessary. Where the mediastinum is dislocated a diminution in the negativity of the intrapleural pressure at once interferes with, if it does not completely destroy the aspiratory factor in the venous blood return, which can be compensated for only by increased cardiac action. Dyspnea and cyanosis may result from this and perhaps also from kinking of some of the larger vessels. The heart accommodates itself very well to gradual dislocations but not so readily to sudden changes of position. The guiding principles in the management of pressures in pneumothorax are: 1. To avoid sudden change in the intrathoracic equilibrium and in the relative position of the intrathoracic viscera. 2. To avoid high pressure in the presence of a flexible mediastinum. 3. Gradually but definitely to increase the positive intrapleural pressure in cases in which pleural obliteration is threatening. 4. To individualize the cases, determining the optimal pressure requirement of each.—*Clinical Significance of Altered Intrathoracic Equilibrium in Pneumothorax with Special Reference to Optimal Pressures.—B. P. Stivelman, H. Hennell and H. Golembe, J. Am. M. Ass., May 13, 1922, lxxviii, 1450.*

Treatment of Pulmonary Tuberculosis with Friedmann's Vaccine.—Since 1919 there were treated, according to Friedmann's method, 34 children and 30 adults. The view that the pulmonary tuberculosis of the adult is the lighting up of a childhood infection seems to be incorrect and is shaken by postmortem findings of the war. Fresh tuberculous infections occur in man at any time and at any age. The question of toxin resistance must be reconsidered. A complete or almost complete toxin tolerance is never attained. If a relative immunity is reached, it lasts at most only one year, as long as living bacilli exist in the body. In how far the views of protein therapy can be translated into the specific methods of treatment, is at present uncertain. It must also be considered that the reacting ability of everybody differs. Friedmann has narrowed his indications for treatment continually. Fever and bronchopneumonic cases are to be excluded. The dosage and the question of repetition of injection are still not clear. It is not possible to attain a lasting improvement with a single injection. The Friedmann cultures seem, according to their pathogenicity, to be closely related to genuine human bacilli and prolonged artificial cultivation may destroy their antigenic properties. Against the Friedmann therapy stands the time lost in waiting for its effects. The good results in children at times are surprising; in adults the results are far less encouraging. It is striking that after treatment a previously positive Pirquet reaction does not become negative. This probably speaks against the specificity of the Friedmann vaccine. The Friedmann method in its present form does not indicate such a distinct forward step that the existing methods of therapy should be given up.—*Zur Behandlung der Lungentuberkulose mit der Friedmannschen Vakzine, R. Güterbock, Beitr. z. Klin. d. Tuberk., June 10, 1921, xlviii, 7.*

Treatment of Pulmonary Tuberculosis with Friedmann's Vaccine.—The author never treated cases with Friedmann's vaccine, but reports on cases observed by him and previously so treated, the purpose being to compare it with sanatorium treatment. A total of 16 cases were observed; 4 first, 6 second and 6 third stage. Complete data are given. The conclusions are that the first stage cases might be questionably tuberculous. In 2 there was no roentgen picture taken before treatment. The statement of Ulrici "that 90 per cent of the cases treated by Friedmann's method show nothing on the roentgen plate" is concurred in. The single finding of a broadened hilum shadow cannot establish the diagnosis of pulmonary tuberculosis. Among the second stage cases no improvement which could be attributed to the Friedmann treatment was noted. In the third stage cases the treatment was discontinued. The conclusion is drawn that at least as much can be attained by a sanatorium course of treatment without Friedmann's remedy as with it.—*Was lehren ausserhalb klinischer Beobachtung mit Friedmannbehandelte Lungentuberkulosen? Schelenz, Beitr. z. Klin. d. Tuberk., June 10, 1921, xlviii, 1.*

Friedmann's Vaccine in Pulmonary Tuberculosis.—Deutsch presents a series of 29 cases, mostly of early active pulmonary tuberculosis without any real organic destruction. The conditions stipulated by Friedmann for the successful application of his method were followed. In most instances the dosage given by Friedmann was followed; in others 0.3–0.5 cm. of the "very weak" emulsion was given in the gluteal or spinal muscles. In almost all cases a small nodule, varying from sago to pea size, formed at the point of injection. The latter was in all cases painless and disappeared in from a few days to a few weeks. Abscess formation was noticed only in one case. Constitutional reaction with

increase of cough, expectoration, and in temperature, was noticed in general cases; hemoptysis lasting several days occurred in one case. In one woman, fifty years old, with advanced pulmonary tuberculosis and temperature of 37.3° to 38°C., after injection of the vaccine, the temperature dropped to 35.8°–36° and the patient died within five days. This case is a warning against administering the vaccine in advanced cases. Of 7 cases in the first stage (Turban-Gerhardt classification), 2 showed no change, 4 improved and 1 improved very markedly after treatment. Of 19 cases in the second stage, 2 showed remarkable improvement clinically as well as anatomically. These cases had severe constitutional reactions after the injections. Of the 16 remaining cases, those of the cirrhotic type showed slight temporary but no lasting improvement; those of the nodose type showed no improvement. In general, the results proved very disappointing. In some cases, there was temporary improvement, lasting from several weeks to several months and then the disease progressed as before. This fact indicates that the reaction caused by the vaccine is analogous to protein reactions and is not an immunization phenomenon, a view which is also emphasized by Uhlenhuth.—*Erfahrungen mit dem Freidmannschen Tuberkulosemittel in der Behandlung der Lungentuberkulose, G. Deutsch, Klin. Wchnschr., January 15, 1922, 1, 120.*

Friedmann's Treatment in Bone and Joint Tuberculosis.—Of 42 children, treated by Friedmann's method, there were 20 actually chosen by Friedmann for treatment, and of these 3 were healed, 7 improved, 3 unchanged, 6 became worse and 1 died. Of the rest, 17 were considered unsuitable by Friedmann, but were treated by the author, and 1 was healed, 8 definitely improved, 3 in general uninfluenced, 2 generally worse and 3 died. All the cases were treated exactly according to Friedmann's published method. The statistics show an unfavorable course of the disease in the second series, in that deaths were more numerous and cures fewer, but, taken in conjunction with the increased number of those who became worse in the first group, the difference between the two groups is not great. Sterile abscesses formed at the site of injection. Sunlight treatment gives good results in the older types of tuberculosis.—*Erfahrungen mit dem Friedmannschen Tuberkulosemittel bei Knochen und Gelenktuberkulose, S. Simon, Beitr. z. Klin. d. Tuberk., May 2, 1921, xlvii, 341.*

Tuberculin Treatment.—Robertson has used mixed human and bovine tuberculin in the treatment of phthisis and osseous tuberculosis for ten years with striking results. The initial dose is 0.00002 mgm. The reactions must be carefully studied. The first effect is to produce a sense of well being for the first twenty-four or thirty-six hours. From thirty-six to forty-eight hours afterwards there is usually a feeling of depression, varying in intensity and duration according to the dose. The aim of the practitioner should be to set up this depression for not more than twelve hours, or, if possible, only a few hours. In lung cases, the temperature, the amount of the sputum and frequency of the cough should be noted as factors for regulating the dose. In the case of wounds or lymph nodes, increased discharge or enlargement of the nodes should be watched. A feeling of shivering or coldness without rise of temperature, if prolonged over a day, is an indication of overdosage. The focal reaction is important. If an overdose is given a lump is formed at the seat of injection. With a suitable dosage the appetite improves and the patient gains in weight and has a sense of well being. Chest cases are difficult to treat. The condition is usually aggravated by mixed respiratory infections. It was found advantageous to give suitable doses of micrococcus catarrhalis, streptococcus pyogenes and pneumococcus in addition to the tuberculin. In obscure and difficult cases with great debility, the tonic effect of tuberculin is marked.—*A Method of Using Tuberculin, R. Robertson, Practitioner, May, 1922, cviii, 354.*

Local Application of Tuberculin in Treatment.—In addition to using tuberculin hypodermically in pulmonary tuberculosis, Crocket has used it for several years locally in lymph node cases, lupus and abdominal tuberculosis, particularly, with excellent results. The tuberculin is made up in an ointment, using anhydrous lanoline as a base when lupus or adenitis is treated. It is used in the form of a liniment when dealing with abdominal disease or pulmonary tuberculosis. The strength of the preparation varies according to the reacting power of the patient, the aim being to secure a definite reaction at the site of application but no general reaction. Koch's O. T. or P. T. or equal parts of both is used. Four different strengths are employed, 1:4, 1:3, 1:2, 1:1, the strength being gradually increased. Diminution of size of the nodes was usually noted within one or two weeks. The action of the tuberculin is accelerated

by exposure to X-ray and radium emanations.—*The Local Application of Tuberculin, J. Crocket, Brit. M. J., April 29, 1922, no. 3200, 679.*

Immunizing Tuberculosis Vaccine.—Raw has treated 88 cases with his new immunizing tuberculosis vaccine. He has subcultured his original virulent culture on glycerine-potato and transferred these to glycerine-agar every month for the past fifteen years. The growths are still profuse and true to type, but they are nontuberculogenic and nonpathogenic for animals. A child who develops primary abdominal tuberculosis or an infection of the neck nodes, caused by the bovine bacillus, is immune to infection by the human bacillus, and young adults attacked by the human bacillus producing pulmonary tuberculosis are immune to bovine infections. For this reason Raw uses a vaccine prepared from bovine cultures in the treatment of human infections and vice versa. A course of treatment consists of 12 injections at intervals of seven days and given in increasing doses. The strength of the injections is 0.001 to 0.025 mgm. The vaccine should be freshly prepared and should not be used after two months. For immunization of susceptible children, 6 injections are given at weekly intervals and repeated in three months if necessary. The doses advised are 0.001 to 0.006 mgm. No symptoms were observed following these injections. The chief object in the treatment of active tuberculosis is to limit the spread of the disease. Fifty-eight cases of pulmonary tuberculosis were treated by this method. After twelve months 26 were apparently well, 27 greatly improved, 2 not improved and 3 died. The fatal cases were unfavorable for treatment. Ten cases of tuberculous lymph nodes responded at once to the treatment; none suppurated. Seven cases of bone tuberculosis responded more slowly, but are making steady progress toward recovery. Nine cases of genitourinary tuberculosis, 3 of abdominal tuberculosis, and 1 of lupus improved markedly. Prophylactic vaccine treatment was given to 136 children whose parents or near relatives were tuberculous. During a period of twelve months none has shown any evidence of tuberculosis. They are still under observation. The treatment was carried out in association with open air and general sanatorium treatment.—*A New Immunizing Tuberculosis Vaccine: Results of Treatment, N. Raw, Practitioner, April, 1922, cviii, 229.*

Effects of Tuberculin on Leucocytes.—The object of this work was to determine whether tuberculin, the supposedly toxic substance of the tubercle bacillus, has any toxic effects upon leucocytes and whether such effects on leucocytes from the healthy body and on those from a tuberculous body differ. The effect of tuberculin on the motility of leucocytes was studied, using the method of the emigration or chemotactic tubes of Wright. It was found that undiluted tuberculin inhibits the emigration of leucocytes and proved that this inhibition is not due to osmotic conditions. A solution of glycerin and broth of the same consistence as tuberculin had some inhibiting effect but not nearly so much as tuberculin, thus showing that the chief effect is from the bacillary products alone. Tetanus toxin and diphtheria toxin also inhibit motility of leucocytes, but this inhibitory action can be neutralized by the addition of antitoxin. It was thought, therefore, that the serum of tuberculous persons or from those whose tuberculosis had healed might contain an antitoxin, the effects of which could be demonstrated in a similar manner; by incubating such sera with tuberculin it was shown, however, that the inhibitory effect of the latter on leucocytes could not be neutralized. To obtain a quantitative measure of the effects of tuberculin the opsonic technique of Wright was used. It was shown that, whereas 5 or 10 per cent tuberculin at a temperature of 20°C. will not always diminish the phagocytic power of the leucocytes when brought into contact with them for sixty minutes, the same dilutions at 37°C. will have a very marked inhibitory influence upon phagocytosis. Glycerine and peptone broth of a strength corresponding to that contained in the tuberculin solution had no effect. Purified tuberculin was prepared according to the method of Koch by precipitation with 70 per cent alcohol and solution of the precipitate in water. It was necessary to expose leucocytes for a comparatively long period at 20°C. to demonstrate the effects of this purified tuberculin. But phagocytosis was decidedly less than normal and the leucocytes stained badly with indistinct differentiation between protoplasm and nucleus. Tubercle bacilli boiled in distilled water were filtered and the filtrate was dried at 56°C. and dissolved in 0.85 per cent salt solution. Leucocytes treated with this solution showed no phagocytosis and were highly degenerated. It was thought that this might be a common property of bacterial toxins, but diphtheria toxin had no such influence. It was also found that anaphylactic shock induced by horse serum injections into a rabbit had no effect on phagocytosis and that the phagocytic power of the white corpuscles before and after the injec-

tion of tuberculin into a tuberculous guinea pig was unaltered. Other experiments showed that neither the substance (horse serum) used for the sensitization of the animal nor a mixture of this substance with serum of the sensitized animal could be proved to have a noxious effect upon the vitality of the leucocytes with regard to phagocytosis. If tuberculin is mixed with serum from a tuberculous or a normal animal and leucocytes are then treated with this mixture, it will be found that the noxious influence of the tuberculin upon the phagocytes has been partly neutralized by the serum, and this influence, it may be shown further, is not removed by the destruction of the complement. The neutralizing effect was proved not to be an acid-alkali reaction. Serum from normal animals practically always had a stronger protective power than serum from tuberculous animals. The degenerative effect of tuberculin on leucocytes was also shown by using the paraffin cell method of Wright. In another experiment an injection of pure tuberculin into the peritoneal cavity of a guinea pig will effect a rich exudation of leucocytes into the peritoneal fluid. Such an exudate, produced in a normal guinea pig, will coagulate slowly, whereas an exudate, similarly produced in a tuberculous guinea pig, will coagulate within a few minutes. By vital staining (mixing the washed leucocytes with a drop of Manson's stain) it is found that the normal leucocytes are full of beautifully stained granules, while the granules have disappeared from the tuberculous leucocytes and a distinct nucleus is seen surrounded by unstained protoplasm. The difference is caused by a reduction of the slight acidity normally present in the protoplasm. The same difference is seen in living and dead leucocytes; and it is concluded therefore that the leucocytes from tuberculous animals are more sensitive with regard to tuberculin than those from a normal animal. The changes were most striking where the tuberculosis was far advanced. The phenomenon must be regarded as a cellular allergic reaction, the tuberculin reaction of the cell.—*Studies on the Effects of Tuberculin, (4) Experiments with Phagocytosis, P. M. Holst, Tubercle, May, 1922, iii, 337.*

Action of Di-Iodyl on Leucocytes.—Di-iodyl, 0.3 gm., taken three times a day, produces either a lymphocytosis or a lymphopoenia. Prolonged administration of larger doses (three times daily, 0.6–0.9 gm) causes lymphopoenia. To prevent lymphopoenia, it is advisable in weak patients to start with small doses and to discontinue the drug for eight days at three week intervals. The absence of gastric symptoms and ready absorption indicate that di-iodyl is especially valuable in tuberculosis and syphilis.— *Über Dijodyl und seine Einwirkung auf das Blutbild, H. Fischer, Beitr. z. Klin. d. Tuberk., October 15, 1921, xlix, 76.*

Copper Treatment of Experimental Tuberculosis.—One per cent copper chloride solution, given to rabbits subcutaneously, in dose 1 cc. per 400 gm. weight, produces marked local necroses in a week, besides disturbance of the general well being, especially loss of weight, which may cause death in the smaller animals. The local point of attack is in the vascular nervous system, affecting the circulation of the local tissues. There appeared to be only a slight effect after subcutaneous copper treatment in peritoneal (general and localized) infection with the bovine bacillus, when the treatment was given coincident with infection: a healing influence upon the disease as a whole was not discernible. Lecutyl salve, applied locally to skin tuberculosis, hastened superficial healing: but except for thin new formed epidermal layers, in spite of intensive treatment with lecutyl salve, the deeper cellular and caseous tubercles showed well stained acid-fast rods. The influence of copper upon tuberculous tissues is strictly local. On account of the increased susceptibility of the vascular nervous system around tuberculous tissues, the action of the copper is greater in these than in normal tissues. The views of von Linden, an advocate of the copper therapy, are not concurred in. An affinity of copper for tubercle bacilli does not exist, and an affinity for tuberculous tissues cannot be verified. The copper treatment of tuberculosis cannot be considered to be a specific therapy.—*Experimentelle Beiträge zur Kritik der Kupferbehandlung der Tuberkulose, mit besonderer Berücksichtigung der Theorie der Kupferwirkungen im gesunden und im tuberkulösen Körper, H. Eggers, Beitr. z. Klin. d. Tuberk., May 2, 1921, xlvii, 373.*

Krysolgan Treatment of Tuberculosis.—Kysolgan, the sodium salt of amino-auro-phenol carbolic acid, prepared by Adolf Feldts, has been tried since 1918 on 49 cases of tuberculosis. *Conclusions*: 1. Injection into tuberculous tissues brings about a similar reaction to that of tuberculin. 2. Very marked improvement of external tuberculosis follows injection. 3. The effect on pulmonary tuberculosis is not so uniform because the focus cannot be reached. Their results, however, claim both subjective and objective improvement. Lupus, and pulmonary lymphatic and joint

tuberculosis were treated and the following conclusions were drawn: 1. Krysolgan is the first chemical specific for tuberculosis. 2. It brings about a cure in many cases, and in the great majority an improvement. 3. Its effect is enhanced in many cases by the simultaneous use of tuberculin. 4. Tolerance for tuberculin is greatly increased by its use. 5. It is the best single remedy for tuberculosis in general practice.—*Die Goldbehandlung der Tuberkulose, E. Levy, Deutsch. med. Wchnschr., February 16, 1922, xlviii, 223.*

Therapeutic Action of Light.—Diphtheria toxin was inoculated into the backs of patients during the Schick test, two and four hours before the test and two to four hours after. The antitoxin was not injected as in the original Schick method to complete the test but, instead, the abdomen was exposed to ultraviolet radiation and the difference in the reaction clearly demonstrates itself when the body is under the influence of these chemical rays, or has been so recently. The exposure to the sun's rays is analogous to that of protein inoculations given parenterally. There is a marked hemoclasis which is temporary and then following by a leucocytosis. Pigmentation, however, protects against this, so that the action does not occur, if the area is well tanned; therefore, it may be advisable with heliotherapy to always have an unpigmented area available for exposure. Extensive burns yield a protein poison which is very similar to that caused by the action of sunlight or the mercury-quartz lamp. If a prolonged light exposure acts as a poisonous irritant to living matter, the absorption of this poison may induce general reaction.—*The Therapeutic Action of Light, F. de Groer, Ann. d. Méd., January, 1922, xi, 52.*

Heliotherapy in Treatment of Tuberculosis.—Various resorts of the United States and Canada are considered in detail to show the methods and results of heliotherapy and the progress that is being made in recent years. The work at Perrysburg, Saranac Lake, Albuquerque, New Mexico, Colorado, Arizona, Asheville, New York, New Haven and California is considered, with the various advantages and disadvantages of the different localities. In general, heliotherapy seems to be an important therapeutic measure but the exact action is not fully understood. The advantage of preventive heliotherapy against tuberculosis is considered in unaffected children and adults. The sun does not stimulate the processes of immunity if there is no infection to begin with. In Australian natives and in cattle of the Hungarian plains, which are constantly in the sunlight, it is shown that general resistance may be marked, but, owing to the total lack of tuberculosis in this environment, if the infection is once begun it is liable to take a malignant course despite preventive sunlight exposures.—*Progress of Heliotherapy in the Treatment of Tuberculosis, G. S. Hinsdale, Brit. J. Tuberc., April, 1922, xvi, 57.*

Heliotherapy of Tuberculous Peritonitis.—A young woman had grave cachexia with considerable ascites. Three abdominal operations failed to arrest the peritonitis. Sunlight exposures were employed for three hours morning and afternoon. After four months a complete cure resulted.—*Heliotherapie de la peritonite tuberculeuse, P. Armand-Delille, Bull. d. l. Soc. Méd. d. Hôpitaux., October, 1921, xlv, 1374.*

Heliotherapy of Middle Ear Tuberculosis.—Tuberculosis of bone is curable, and heliotherapy aids greatly. Tuberculosis of the ear is a local manifestation of more generally distributed tuberculosis and, hence, systemic treatment is indicated. The method of insolation consists in local and general exposure to the sun's rays, combined with climatic and dietetic therapy. In cloudy weather artificial lamp light is employed. Heliotherapy seems to be superior to operative interference.—*Die Heliotherapie der Mittelohrtuberkulose, A. J. Cemach, Wien. med. Wchnschr., February 12, 1921, lxxi, 313.*

Twenty Years' Experience with Air and Sun Baths.—The writer recommends muscular exercise before instead of during the air bath and disapproves of cold sponges afterward. The gymnastics should be discontinued because they increase the cutaneous temperature and then, with the drop of body warmth, colds are easily contracted. Beginners should never take an air bath at a temperature below 15°C. The duration is determined by the warmth of the body and general feeling. Weak and anemic patients should expose themselves in very warm weather. It is contraindicated for patients with acute catarrh of the air passages, gastroenteritis and nephritis. It is excellent for many other conditions, such as surgical tuberculosis, neurasthenia and eczema. The sun bath should be carried out only under the physician's directions. After the sun bath one should lie quietly for fifteen to thirty minutes. Patients with pulmonary tuberculosis should never take

sun baths; similarly, those with disease of the vascular system should avoid them because of the marked drop in blood pressure. However, in other conditions of the air passages, especially in asthma, the sun bath is particularly advantageous. In the treatment of such cases there has never been any harm noted.—*Zwanzigjahrige ärtzliche Erfahrung über Luft- und Sonnen-bäder, H. Hoffner, Strahlentherapie, 1921, xii, 819.*

Treatment of Skin Tuberculosis with Light and Pyrogallic Acid Ointment.—Good results were obtained in 5 cases by means of a combined light and pyrogallic acid ointment treatment. The treatment consisted of daily changes of bandages and the application of 10 per cent pyrogallic acid ointment to the diseased skin. From the fifth day urine examinations for albumen and red blood cells are indispensable. Local light and pyrogallic acid ointment are combined at the beginning, while the general light treatment is also used. When the diseased tissue is sufficiently destroyed down to healthy tissue, moist bandages of acetic acid and fuller's earth, corrosive sublimate (1:1000) or 3 per cent resorcin are applied a few days, and then the fresh granulating wound is treated with 1 or 5 per cent pyrogallic acid ointment. When epithelial covering has progressed further the pyrogallic acid ointment is replaced by *Unguentum colloidale Crede*. In a number of cases the lupus nodules were curetted out, dressed dry for a day, and then treated as above (light and pyrogallic acid). In using the lower concentrations of pyrogallic acid, it was advantageous to alternate a number of days with moist bandages, to soften the scabs so that they could be easily removed with a scissors. In this way the treatment, which would ordinarily require months and years of light treatment, could be materially shortened and healing with smooth scar tissue occurred.—*Die Behandlung der Hauttuberkulose mit Licht und Pyrogallussalben, K. Klare, Beitr. z. Klin. d. Tuberk., October 15, 1921, xlix, 1.*

Combined X-Ray and Sunlight Treatment in Granuloma.—A case of rapidly developing malignant mediastinal lymphogranuloma is reported in which X-ray treatment alone was of no value. Instead, after such exposures, the general condition and the blood picture became worse. After intensive natural and artificial heliotherapy, the general condition improved remarkably and reaction to X-ray exposure was better. After four months' treatment normal conditions were restored, the tumor retrogressing rapidly. There has been no recurrence after two years.—*Combinierte Röntgen- und Heliotherapie bei Granuloma, A. Lahmann, Munch. med. Wchnschr., September, 1921, lxviii, 1249.*

X-Ray Treatment of Pulmonary Tuberculosis.—Roentgen irradiation of this type of tuberculosis can be regarded only as an aid. The treatment should be applied chiefly to the chronic fibrous forms. The exudative lobular types should not be exposed. The best dose is one that is just stimulating.—*Röntgenstrahlen Behandlung bei Lungentuberkulose, A. Stephan, Therap. Halbmonatshefte, November, 1921, xxxv, 649.*

X-Ray Treatment of Pulmonary Tuberculosis.—Exposures are made to stimulate the function of the blood-forming organs, namely, the spleen, the sternum and the long bones. Of 23 cases, all in an advanced stage of disease and mostly with cavities, 5 are described in detail. All were decidedly improved. Patients able to rest or to do only light work respond better than others. The results seem to justify further application of this method of treatment.—*Röntgentherapie der Lungentuberkulose, F. Tremolieres and P. Columbier, Bull. de l'Acad. d. Méd., February, 1922, lxxxvii, 198.*

X-Ray Treatment of Tuberculosis of Testis and Epididymis.—The X-ray acts by stimulating granulations, the results being more favorable with smaller doses. Light treatment is also employed with salt baths and dietetic treatment. If the tuberculous processes are confined to these organs, X-ray exposures can accomplish radical cures. In advanced conditions that have spread to the rest of the genitourinary tract, X-ray irradiations may at least check further development and prevent extension. Moderately hard rays are used, distributed over a number of sittings and in small doses. In tuberculosis of the deepseated genitourinary organs, extremely hard rays with deeper penetration are advised. At times it is wise, before X-ray exposure, to surgically remove areas of local disease.—*Röntgenstrahlen Behandlung, L. Freund, Wien. klin. Wchnschr., October, 1921, xxxiv, 511.*

Treatment of Genital Tuberculosis by Operation and X-rays.—By employing X-ray therapy before operation the body is immunized against tuberculosis, so that there is protection against new areas of infection and residua. The X-ray can be employed for treatment instead of prophylaxis, but is preferable only when operation is contraindicated. The results in the past few years

by this means of treatment have been very satisfactory.—*Über die Kombination der operativen Therapie der Genitaltuberkulose mit der Röntgenbestrahlung, E. Vogt, Deutsch. med. Wchnschr., 1921, no. 11, 280.*

Stimulating Action of Small Doses of X-Ray.—Large doses aggravate the pathological condition; small doses have a curative action, stimulating the cells to normal function. Recent works of other authors emphasize these points, as is shown by the treatment of diabetes by radiating the pancreas and of nephritis by radiating the kidneys, and of psoriasis by exposing the thymus. This appears to open up a newer field for radiotherapy.—*Stimulating Action of Small Doses of Roentgen Rays, S. Nordentoft, Ugeskrift f. Laeger, October, 1921, lxxxiii, 1353.*

Carbon Arc Treatment of Tuberculosis.—Seven cases of bone, lymph node, kidney and peritoneal tuberculosis were treated with from forty to one hundred and fifty exposures. Four patients were cured, two improved, and one unimproved. The unimproved case was lymph node disease. The lamp resembles sunlight in its spectrum, but is much more convenient to employ. It can be used regardless of the climatic conditions. It is more effective than the mercury quartz lamp and just as effective as the X-ray, without any dangers.—*Treatment of Surgical Tuberculosis with Carbon Arc Lamp. P. H. Sauer, Ann. Surg., April, 1922, lxxv, 400.*

Statistics on Phthisis.—The studies were made at the Freiburg Pathological Institute, and attention is called to the fact that practically all the previous figures were obtained from north or middle Germany. Children under 1.5 years were found phthisical in only 5.6 per cent of the cases, while during the age of 1.5 to 18 years in 66.6 per cent. In adults the pleura is involved in the majority of cases of phthisis (88.1 per cent). In adults evidence of primary phthisis was found in 94 per cent of phthisis and in 87.1 per cent of the total cases. Persons under 18 years of age revealed calcification in 75 per cent of the primary nodules, which does not agree with Lubarsch and Nägeli who found that calcification increases with age and is rare in youth. The author is unable to explain the differences in these two findings. In adults, 70.6 per cent of the tubercles contained lime deposits, in 10.4 per cent they were chalky, in 4.8 per cent caseous (beginning encapsulation or completely encapsulated) and in 13.9 per cent other types of tubercles were found. The mortality from phthisis was greatest between the ages of 18 and 30 years, the number of infections increasing with age. It is considered very important in statistics of this type to separate the first 1.5 years from childhood, and the latter from adult life. It is concluded that the figures for later life phthisis are not applicable to all other localities.—*Statistische Mitteilungen über phthisische Erkrankungen bei verschiedenen genauen Sektionsmethoden, K. Schirp, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 308.*

Tuberculosis Death Rate, First Six Months of 1922, Metropolitan Life Insurance Company.—The records of the Industrial Department of this Company show a decline of 13 per cent in the death rate from tuberculosis for 1922 as compared with the same period of 1921. The continued decline is very gratifying in view of the difficult economic conditions of the last eighteen months. There has as yet been no significant let-up in the fall of the tuberculosis death rate; and there is little doubt that antituberculosis agencies will continue to make inroads on this mortality regardless of periodic changes in the business and employment cycle. There is evidently some influence at work on the death rate from tuberculosis which is independent of immediate economic conditions.—*Mortality Record of the First Six Months of 1922, Statistical Bulletin, Metropolitan Life Insurance Co., July, 1922, iii, no. 7, 3.*

Function of State Tuberculosis League.—The Massachusetts Tuberculosis League exists for the purpose of studying and promoting the best and latest methods for carrying on the antituberculosis work in the state and thus promoting the public health. In addition to its general routine the league, last year, made a small appropriation for research work in the study of tuberculosis among children, and already some valuable data have been collected. The seeking of an endowment to further the work of the league is advocated. One or more sanatoria, exclusively for children, should be provided in the state and the league should take the lead in influencing public opinion favorably; one of these sanatoria should be at the seaside for the care of nonpulmonary disease in children. Another object for league propaganda is the establishment of preventoria in the state. An effort should be made to have a social service worker in each state sanatorium to assist in handling the personal problems that so often confront patients. Time has proved that tuberculosis usually becomes arrested only under sanatorium treatment and that there is a great need for

after-care. The state and local associations should follow these patients and help to find suitable employment at the proper time and to guard against unnecessary risks. The most successful means of preventing tuberculosis is to prevent its happening. The clinics now held by the experts of the state board of health should enlarge their functions and offer to everybody who wishes it an examination of the lungs, and urge the importance of so doing. Such preventive measures the league should urge and support.—*The President's Address at the Annual Meeting of the Massachusetts Tuberculosis League, E. O. Otis, Boston M. & S. J., July 20, 1922, clxxxvii, 93.*

Tuberculosis among Peasants of Anatolia.—Autopsy on 71 Anatolian peasants revealed phthisis in 50 (70.42 per cent). The distribution was as follows: Generalized tuberculosis, 74 per cent; caseous bronchial lymph nodes, 68 per cent; large nodular pulmonary, 56 per cent; intestinal, 50 per cent; pleuritis, 46 per cent; serous membranes, 44 per cent; caseous mesenteric lymph nodes, 30 per cent; isolated pulmonary tuberculosis, 22 per cent. Thirty-seven cases of generalized tuberculosis revealed caseous bronchial nodes in 79 per cent; nodular tuberculosis of the spleen in 76 per cent; ulcerative tuberculosis of the intestines in 68 per cent; tuberculosis of the serous membranes in 57 per cent; and of the mesenteric nodes in 37 per cent. Among 22 cases of tuberculosis of the serous membranes 82 per cent were with involvement of the peritoneum, pericardium, etc., and 55 per cent with pleural involvement. Caseous bronchial nodes were found in 88 per cent of the cases of coincident pulmonary tuberculosis; caseous mesenteric nodes in 93 per cent of generalized tuberculosis, 80 per cent of pulmonary and only 67 per cent of intestinal tuberculosis. The frequency of caseous mesenteric nodes, ulcerative intestinal tuberculosis, large nodular tuberculosis of the spleen, liver, kidney and peritoneum in adults and the rareness of isolated pulmonary tuberculosis indicate the diminished resistance to hematogenous spread.—*Über Schwindsuchtsbefunde bei anatolischen Bauern, W. Bergerhoff, Beitr. z. Klin. d. Tuberk., October 15, 1921, xlix, 108.*

Tuberculosis in India.—The prominent but little realized part played by tuberculosis in hot countries calls for measures of prevention as urgent as any ever applied to malaria and enteric fever. Out of a total annual strength of from 2,300 to 3,000 picked natives, 582 members of the police force of Assam and Bombay died from tuberculosis between 1901 and 1919. The Pirquet test applied to cover 1,500 recruits, mostly from the Konkan and Deccan, yielded only a total of 87, or 5.37 per cent, positive results, chiefly among Punjabis and Pathans, thus tending to prove the absence of immunity. The Kalmucks were almost invariably negative to the test; they are free from tubercle in their native country but are ready victims after exposure to infection among Russian troops. Owing to the floating character of the native population, the startling prevalence of tuberculosis in Bombay is not evidenced by the mortality statistics; of some 600 tuberculosis cases it was found that over 80 per cent of the patients died outside Bombay city. The disease affects all ages and as a rule, owing to low native immunity, runs a much more rapid and fatal course than in the European. In 1906 inquiry, initiated by the chief of police into the after-history of 86 members of the police force invalided for pulmonary tuberculosis between 1902 and 1904, showed that 76 were dead, 4 were untraced and presumably dead, 5 were ill and only 1 was well. Tuberculosis among cattle in India is very rare and in Bombay bovine tubercle is nonexistent, a fact which may account for the acute course of the disease in the unprotected native; it is to be noted too that unboiled milk is seldom drunk and butter is invariably boiled. Because of the careless expectorating of the native, dust is considered a fertile element of danger. In the native the first symptom of pulmonary tuberculosis is fever, not cough. In nine out of every ten cases of continuous chronic fever the underlying cause is tubercle, sepsis or enteric fever, but very often tubercle; the fever may be quotidian or intermittent and is often as high as in malaria. Physical signs seldom accompany the initial fever but the X-ray usually shows a tuberculous deposit near the hilum of the lung. Tubercle bacilli can be demonstrated in the sputum usually much earlier and more frequently in the Indian than in the European case of phthisis. Hemoptysis is relatively an uncommon symptom in the native and is seldom fatal; it was present in the early stage in only 5 per cent of patients of the police force up to the time of invaliding and in only 4 of 92 other natives suffering from pulmonary tuberculosis. In contrast to the prevalence of acute pulmonary tuberculosis in India, chronic fibroid phthisis seldom occurs. Acute tuberculous bronchopneumonia is not rare and lobar pneumonia is often due to fulminating tuberculous infection. Of 8,000 autopsies performed on Bombay natives, the writer, pathologist to the Bombay coroner, found only 2.3 per cent with healed or chronic tubercle. Tuberculous meningitis proved an

occasional cause of sudden death. Of other forms of tuberculosis, lupus and tuberculosis of the bones and joints are much rarer in Assam and Bombay than in Europe although in the Punjab surgical tuberculosis, due possibly to the effect of the colder climate, has been stated to be relatively common. In the Bengal villages, which are not overcrowded, tuberculosis is more common than in the Bombay villages and accounts for 9 per cent of the total deaths; milk contamination may be the reason for this. In Ceylon tuberculosis of the lungs, originally rare, is now more prevalent and runs a much more rapid and unfavorable course than in Europe. In Burma the disease is particularly common in Rangoon but not so in Mandalay, a contrast attributed to the climatic differences of the moist heat of the former and the dryness of the latter.—*Tuberculosis in India, A. Powell, Tubercle, July, 1922, iii, 444.*

Tuberculosis in Thüringen Village of Heinersdorf.—The village of Heinersdorf is considered to be especially heavily afflicted with tuberculosis. It is about 400 metres above sea level, has a suspicious water supply, but in spite of the latter typhoid fever is rare. It is the seat of a toy industry, the finishing of dolls and other toys of clay and papier maché. This industry appears to have no marked effect upon tuberculosis. As far as living facilities are concerned sanitary houses are lacking and badly needed. The amount of tuberculosis in Heinersdorf is far less than has been generally considered to be the case.—*Untersuchungen auf Tuberkulose in einem thüringischen Dorfe, Kreissmann, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 288.*

Tuberculous Diseases Diploma (Wales).—Efforts to combat tuberculosis should not be relaxed because of the decreasing death rate. This lessened mortality has probably been associated, not with a diminution in the number of infected persons, but with a diminution in the severity of the clinical type of the disease. The diffusion of infection has probably increased rather than diminished during the period of this fall in mortality and the fall may be partly explicable in the terms of the wide diffusion of mild infection. There is, at least, no reason to draw the conclusion that our measures for the control of tuberculous *infection* have been successful. The future campaign should include the assumption of some measure of responsibility by the authorities of local and even national government. This right to interfere carries with it the obligation to act only on the best technical advice, and highly trained specialists are needed to coöperate with the administrative medical officers of the public health services and with the general practitioners. It is to foster the study of tuberculosis as a whole, to set up a goal to be attained, and to provide a guarantee that a certain standard has been reached that the Tuberculous Diseases Diploma has been initiated at the University of Wales. The tuberculosis expert should build his experience, not alone on the foundations of a general medical training, but upon special postgraduate study of what is one of the most intricate problems in the whole range of medicine. The criticism that the diploma will tend to encourage "specialization" is answered by the argument that the object is not to increase the number, but rather to improve the quality of the tuberculosis specialists. The objection to "additional letters" is not considered seriously, for it is the thing that counts, not its designation. It remains to be seen whether the new diploma will receive the support of the profession or not; but the effort has at least been made and the omens are favorable. A copy of the regulations for entrace to the examination for the Tuberculous Diseases Diploma of the University of Wales (T. D. D. Wales) is appended.—*The Tuberculous Diseases Diploma (Wales) and What It Aims At, S. L. Cummins, Brit. J. Tuberc., July, 1922, xvi, 115.*

Emergency Instruction of Tuberculosis Examiners.—Medical officers assigned to duty in veterans' hospitals operated by the United States Public Health Service are routinely trained in examination duties and full-time physicians in the field are also often assigned to a tuberculosis hospital for a few months for instruction in this specialty. For part-time physicians a short, standard course of training has been prepared, limited to a week or ten days. A class includes from 6 to 10 men and the course is opened with a two-hour cinema demonstration, showing approved methods of chest examination. The first one and one-half days are devoted to a study of the physical examination of the normal chest. The next half-day is devoted entirely to detecting râles in the tuberculous chest. It is assumed to be unnecessary to "cultivate" the ear to distinguish râles, and that any capable physician with normal hearing is immediately able to detect them. If, therefore, one cannot hear râles and distinguish the various kinds and their place in the respiratory cycle, he proceeds no further with the course. The student is taught to attach the utmost significance to persistent, post-tussive, fine, moist râles in or near the apex. Regardless

of his proficiency in other methods of diagnosis, he must fully understand this elementary sign and become adept in eliciting it. On the third day a clincal study of the diagnosis of tuberculosis is begun. This includes a study of history and symptoms, but chiefly the actual examination of patients. The instructor, making frequent use of the double stethescope, gives individual instruction. The student is required to present a written summary of the interpretation of his findings together with other data. Reading references are given and quizzes are held in connection with the daily practical work and a uniformity of policy established, so far as possible, as to the advice to be given regarding change of climate and other moot points. Special efforts are made to teach early diagnosis and to discriminate between tuberculosis requiring treatment and that which does not. Roentgenograms are not studied. Neurocirculatory asthenia is given special consideration in differential diagnosis and as a possible complication. It is impressed that certain cases must have a period of hospital observation before a diagnosis can be made.—*Emergency Instruction to Examining Physicians in the Diagnosis of Pulmonary Tuberculosis, H. S. Cumming, Brit. J. Tuberc., July, 1922, xvi, 125.*

Marriage of the Tuberculous.—Education of the advanced, actively tuberculous, pointing out the folly of their marrying, is not at all adequate to prevent such marriages; proper legislation alone can tend to prevent them.—*Heiraten Schwerlungenkranker, Schaefer, Zschr. f. Tuberk., May, 1922, xxxvi, 180.*

Tuberculosis and Pregnancy. — Although no dogmatic attitude should be taken, the following summary may be regarded as a working basis for the obstetrician and the internist who may be called upon to decide whether or not a tuberculous woman may safely bear a child, or for or against termination of a pregnancy. 1. Pregnancy is not an important etiological factor in the development of pulmonary tuberculosis, although sometimes the disease develops following parturition and during lactation as a consequence of the debilitating effects of these periods. 2. A diagnosis of active pulmonary tuberculosis in a pregnant woman should be made only on positive evidence, since such patients may normally show temperature variations. 3. Old tuberculosis of slight extent with physical signs of an inactive peribronchial condition is rarely reactivated as result of pregnancy; latent and inactive parenchymatous lesions of the same extent more frequently become active and progressive. In early clinically cured cases pregnancy may be permitted under favorable conditions. Such patients should, however, be treated as cases of potentially active tuberculosis. Primipara and women with pregnancies following rapidly one after the other are especially in danger of reactivation during pregnancy. 4. The majority of cases of active pulmonary tuberculosis in all stages and of quisescent or arrested diseases, especially if advanced, are unfavorably influenced by pregnancy. The disease generally begins to progress during the first three months of pregnancy or following parturition. 5. A small number of patients with active disease are not deleteriously influenced by pregnancy; improvement occasionally occurs despite and not because of pregnancy. 6. The possible effects of the pregnancy cannot be positively foretold. 7. The probability and the degree of unfavorable effect is greater, the more advanced the disease. 8. The prognosis of the pulmonary disease is worse than in similar cases without pregnancy, if there are present impaired nutrition and particularly a persistent loss of weight, laryngeal tuberculosis, a persistently high pulse rate even without fever, continuous or periodic fever even without an extensive lesion, symptoms and signs of rapid destruction of pulmonary tissue, unfavorable social and economic conditions or unfavorable complicating symptoms on the part of the pregnancy. 9. The indications for or against interruption of the pregnancy are determined by the peculiar conditions in each case. 10. Before artificial abortion is resorted to the patient should be given the benefits of a thorough hygienic-dietetic course of treatment and, in suitable cases, of artificial pneumothorax, which has no deleterious effects on the course of the pregnancy. 11. If under favorable conditions of treatment the disease remains active and persistently progresses or in the presence of the unfavorable symptoms enumerated, interruption of the pregnancy is indicated in all stages of the disease during the first four months of the term. Laryngeal tuberculosis even without extensive disease of the lungs is a definite indication for the early termination of pregnancy. Early interruption is especially indicated in arrested cases which set up acute activity in the first few months of pregnancy and in cases which give a history of exacerbation and progression of the disease during a previous pregnancy. 12. After the fourth month interruption does not, as a rule, improve the prognosis of the pulmonary disease. It is permissible early in this period under urgent indications in moderately advanced cases without serious complica-

tions but is definitely contraindicated in prognostically unfavorable advanced cases. 13. Premature induction of labor on account of the pulmonary disease is practically always contraindicated. 14. The operation of choice for emptying the uterus prior to the fourth month is vaginal hysterotomy under gas and ether anesthesia. 15. Sterilization to prevent future pregnancies is justifiable only under exceptional circumstances and only in multipara with living children, in women with rapidly following pregnancies and in working women.—*Tuberculous and Pregnancy, H. Schwatt, N. York M. J. and Med. Rec., July 5, 1922, cxvi, 24.*

Additional or Reinfection Tuberculosis.—Observations made during the war confirmed the belief in the universality of tuberculous infection among civilized and urbanized people. It was also noted that men brought for the first time in contact with infection (for instance, the Senegalese negro troops of the French army) developed an acute type of tuberculosis similar to that of childhood. European and American troops manifested a different type of disease in the majority of cases. Only a few were acute, doubtless having escaped infection in early life; "the bacillus enlisted with the soldier" (Osler). The many rejections in the American army for tuberculosis (2 to 6 per cent) resulted in relatively few cases developing during service. In many communities a large number of undiscovered tuberculosis cases exist and they do not come to notice unless and until a special effort is made to find them. The presence of so much latent tuberculosis shows the fallacy of considering any given case one of recent infection. Infection occurs as the result of family exposure in admittedly one-half of the cases and a succession of slight illnesses or even pronounced symptoms over a considerable period of years may usher in the pulmonary disease. Added infection from the household may be true but need not be assumed. The previous implantation and auto-reinfection can account for the successive stages. With no family exposure the tendency is to assume a later date of infection, generally in young adult life. A more careful history and the war experience with the great increase in tuberculosis in undernourished people connect these cases with early age infection reactivated by privation and strain in a very large number. The more thoroughly so called massive infection is analyzed, the less it can be regarded as frequent or massive. The history of those closely exposed to reinfection makes the danger of additional infection during adult life seem small. Experimental work on infected animals shows a high degree of protection against the invasion of fresh infection from outside. The type of clinical tuberculosis can be explained by the date and amount of the first infection as well as their frequency before maturity. The different types of Brownlee are not considered necessary to explain the various manifestations of the disease at different life periods. Some hold that the primary infection is sufficient to account for all subsequent disease or immunity, as the case may be. Experimental evidence hardly supports such conclusions. Natural infection may be repeated and the immunity is subject to fluctuations. In the opinion of the writer, the increased death rate from tuberculosis during and subsequent to the great war points to an overwhelming amount of reactivated latent infection. The disappearance of the bovine type following puberty is discussed. It is concluded that too much emphasis has been placed on late infections and efforts to discover the potential victims of clinical tuberculosis earlier are indicated as well as the safeguarding of the young against infection.—*Additional or Reinfection Tuberculosis, E. R. Baldwin. Brit. J. Tuberc., July, 1922, xvi, 120.*

Large Series of Pirquet Tests on Infants and Young Children in New York City.—The Pirquet test (scratch method) was applied in 3,742 medical cases seen at the Babies' Hospital, New York, during six years prior to 1919. The test was positive in 573 cases (15.3 per cent). Crude undiluted O. T. was used. The proportion of positive tests was the same in both sexes. Two hundred and twenty negro children were tested; and of these, 45 (20.45 per cent) were positive. Of the 3,522 tests made on white children 528 were positive (14.99 per cent), showing 5.5 per cent greater incidence among the colored children,—an incidence perhaps lower than that for all the negroes of the city as these were mostly children of prosperous negroes. Moreover, the figures for white children do not represent the incidence among the poorer classes of the city. Of the very complete and detailed statistics given, the following have been selected as of especial interest: Of 687 tests on infants under 3 months of age, 1.89 per cent were positive. Of 2,000 tests on infants under 1 year of age, 7.35 per cent were positive. Of 512 tests on children three years and over, 32.24 per cent were positive. Of 147 infants under 1 year of age giving positive reactions, 75 died in the hospital; 17 others were removed, of whom 7 had tuberculous meningitis and should be counted as fatal cases; 10 had clinical evi-

dence of probable tuberculosis in some other form on discharge. Twelve others were discharged "unimproved," but without definite evidence of tuberculosis; 14 were "improved," one tuberculous; 29 were "cured," none tuberculous. The total mortality for 151 children between one and two years of age giving positive tests was 37.7 per cent; for 107 "positive" children between 2 and 3 years of age, the mortality, including cases with meningitis, was 26.1 per cent; for 168 "positive" children, 3 years of age and above, the total mortality was 5.9 per cent. With regard to the question of negativity of the Pirquet test in very feeble tuberculous infants, there were 33 such patients in this series. However, 9 infants had sufficient resistance to live ten days or more. Of these 9, whose tests we should expect to be positive, 4 had miliary tuberculosis, 4 were cases of tuberculous meningitis and 1 had marasmus. Thirty-one cases showed the difficulty of determining the mode of infection. Twenty-nine of these were entirely breastfed (thus ruling out bovine infection). In none could it be proved that there had been contact with a tuberculous person, though of course allowance must be made for persons not knowing of their tuberculosis. Of 13 "positive" infants under three months of age, 4 mothers were definitely tuberculous, and in 3 other instances there was probable tuberculosis exposure. In 6 instances there was no known exposure. In a group of 433 proved tuberculous cases, irrespective of the Pirquet test, exposure was definite or probable in 24.7 per cent. There was no history of exposure in 75 per cent.—*Data in Three Thousand Seven Hundred and Forty-two Pirquet Tests, S. McLean and H. Jeidell, Am. J. Dis. Child., July, 1922, xxiv, 73.*

Tuberculosis in Infancy.—The course of tuberculosis in infancy differs considerably from that at any other period of childhood. The relative simplicity of the life and diet of the infant makes it possible to ferret out the source of the infection and to study the reaction to a first infection. The roentgen ray and tuberculin tests have rendered the diagnosis comparatively easy, and it is now generally conceded that congenital or intrauterine infection is a great rarity. Only 20 such cases are mentioned in the literature. These lived but a few weeks and presented only the vaguest symptoms. Even the tuberculin test failed in certain of these cases, either through failure of skin allergy to develop in this short time, or through extinction of the reaction due to the widespread changes in the organs. Just when the tuberculin reaction becomes positive is still a disputed point, but Herbert Koch is of the opinion that a positive reaction before the fifth week must be regarded as due to an antenatal infection. Of the 77 cases of tuberculosis in infancy observed by Fischl between the years 1915 and 1920, one gave a positive reaction on the sixteenth and another on the twenty-fourth day of life. Of 3,550 infants regularly subjected to the Pirquet test every fourth week, 518 (14 per cent) reacted positively. The percentage of positive reactions among children born at the lying-in hospital ranged from 0.36 to 3.35, whereas among those coming from outside it was between 5.36 and 16.67 per cent. Infection in the vast majority of cases occurs through the inhalation of infected material and the production of a primary focus in the lung. The regional tracheobronchial nodes become involved secondarily, but the latter may assume such an important rôle in the symptomatology as to arouse the suspicion that the original infection occurred at this site. In one instance, however, the primary focus occurred in the middle ear, and in another in the nose. Of 40 autopsies, in only two cases did the infection occur by way of the intestine. Infection usually occurred through exposure to another infected individual in the same household; and in this connection it is well to remember that one such sick child may infect others in the family, the duration of exposure required to cause such infection being at times only a few hours. As regards symptomatology and diagnosis, the tuberculin tests and roentgen ray offer invaluable aid. The commonest symptoms are cough (often pertussis-like in its character and persistence), expiratory wheezing or stridor (due to compression of a large bronchus by an enlarged lymph node), loss in weight, and fever of otherwise unexplained cause. Skin tuberculides are of the greatest possible diagnostic singificance, but were not found in this series. Intestinal symptoms, adenitis and splenic enlargement were such infrequent occurrence as to be of no significance. Bone tuberculosis, said to be very rare in the first year of life, occurred five times, three times affecting the middle ear. The physical signs in the lungs were very misleading, and not in accord with the autopsy findings, and especially was this true of cavities, which were never detected during life. The same is true of miliary tuberculosis, which was found much oftener at autopsy than was suspected on previous examination. The Pirquet reaction was not always reliable, a fact which may perhaps be explained, first, by the possibility of an unreliable preparation of tuberculin, second, a change in the skin allergy due to the nutritional conditions of the war, third, a

bovine type of infection, or fourth, a seasonal variation as reported by Hamburger. In 30 cases a positive Pirquet was verified by the finding of tuberculous foci at autopsy, but in 6 the Pirquet was negative, although tuberculosis was found postmortem, and in 4 instances a positive tuberculin reaction could not be thus corroborated. The mortality rate in this series was 58.8 per cent. Prophylaxis is therefore of much greater importance than treatment. In the therapy, general hygienic measures have been much more valuable up to the present than attempts at specific therapy.—*Die Tuberkulose im Säuglingsalter, R. Fischl, Arch. f. Kinderhk., lxxi, February 21, 1922, 6.*

Benign Tuberculosis of Infants.—Tuberculosis occurring in infants during the first year was long regarded as uniformly fatal. Only slightly less grave was that contracted during the third six months. This view needs modifications since tuberculin has indicated the large number of infected babies. Many authors still contend, nevertheless, that a positive tuberculin reaction in these infants spells death. Their statistics are based upon hospitalized children, infants actually ill, if not of tuberculosis, of other diseases of harmful influence. On the other hand, when the tuberculin reaction is systematically performed on babies apparently well and in a healthy environment, many of them reacting positively not only do not die but do not even become ill. This study was made in an infant's ward of the Laennec Hospital, Paris, where are received only babies of mothers either definitely tuberculous or suspected of being so. While the mother goes to an adult ward, the baby, from the moment of arrival, is kept safe from maternal contagion. Under these circumstances the authors have been struck not only by the slight evidences of disease but also by the relative frequency of completely latent tuberculosis. The term *floride* is here used to connote flourishing, and is applied to the infant's general appearance and not to the disease. It is required that the babies shall show no evidence whatever of tuberculous infection beyond a strongly positive skin reaction to tuberculin and the radiographic picture of enlarged hilum and mesenteric lymph nodes. The infants must also preserve their excellent health for a certain period of time. They are accordingly classified in two groups: (1) those infected during the first six months and continuing healthy during the first year and (2) those infected prior to eighteen months of age and remaining healthy throughout the second year. There are described four cases from group (1) and four from group (2), in all of which the source and moment of infection could be determined more or less exactly and all of whom continued in vigorous health for from 12½ months to 2 years and 9 months after the implantation of the bacillus. As to the frequency of this so called "florid form," 52 cases of tuberculosis were diagnosed in the period during which the cases described were under observation. This form represents, therefore, 15.38 per cent of cases of tuberculosis in infancy. In analyzing the circumstances of infection in the infants conforming to the florid form, one is struck by the presumably small amount of their infection. This point is determined by considering the duration of and intimacy of contact with the infecting individual, the latter's degree of contagiousness and the precautions taken by him. Of the 8 cases detailed, 7 apparently owed their favorable outcome to relatively small dosage. This study indicates that such a benign form of tuberculosis not only exists but comprises about 15 per cent of tuberculosis in infants. The determining factor is the small amount of infection. Super or reinfections constitute the great danger and against them should be centered the chief effort in combating tuberculosis in infancy.—*La forme floride de la tuberculose du nourrisson, R. Debré and P. Joannon, Ann. de Méd., April, 1922, xi, 336.*

Infants of Tuberculous Mothers.—Fifty-one infants of tuberculous mothers were observed for periods of from several months to a year, and then repeatedly reëxamined up to the second and fourth years. Although all of the mothers had severe, active tuberculosis, fourteen (27 per cent) of the infants, though intimately exposed, remained uninfected. Eleven of these were under six months of age, three between six and twelve months, and eight of the fourteen were breastfed. Seven were reëxamined between the ages of three and five years, and three showed definite evidence of active tuberculosis, whereas four remained free from the infection, judged by clinical, roentgenological and tuberculin tests. Of the 51 children comprising the basis for study, 37 (73 per cent) were infected on admission, 26 (71 per cent) of the infected children dying of tuberculosis and 11 (29 per cent) being apparently well at the time of discharge. An opportunity was afforded to reëxamine only 7 of the latter after the first year of life, the oldest at 3½ years, but all had remained entirely well. The most effective therapy was found to be open air treatment with a

concentrated, high calory diet.—*Über Säuglinge tuberkulöser Mütter, K. Barchetti, Monatschr. f. Kinderhkr., September, 1921, xxi, 563.*

Frequency of Tuberculous Infection in Childhood.—Variation in pediatric tuberculosis statistics in different cities may be explained (1) by actual variation in the incidence of the disease, (2) by difference in the methods used for examination and (3) difference in the selection of the material. To obtain a true picture of the "average" incidence of tuberculosis among the children of a community, it is proper to examine children from schools or kindergartens, or even from infectious disease hospitals. Statistics, such as those of Pirquet, obtained by examination of dispensary children, give an exaggerated idea of the prevalence of the infection. Of equal importance from the point of view of accuracy is the method of testing the children. The inaccuracy of the Pirquet cutaneous method is shown by the fact that Pirquet found in children from 11 to 14 years of age an incidence of tuberculosis of only 56 per cent, while for a similar group Hamburger and Monti found 95 per cent. Hamburger's method consists of the usual cutaneous or percutaneous test with concentrated tuberculin. Negative cases are injected subcutaneously with 0.01 mgm. tuberculin. This test, if negative, is repeated once, or, if necessary, twice, at twenty-four hour intervals. If the place of injection shows no redness or infiltration, the child may be regarded with nearly absolute certainty as free from tuberculosis. Though time-consuming and bothersome, this method is recommended for its much greater accuracy. —*The Frequency of Tuberculosis in Childhood, F. Hamburger, Am. J. Dis. Child., June, 1922, xxiii, 481.*

D'Espine's and Allied Signs in Childhood.—The sign to which D'Espine originally called attention, a standard sign for clinical detection of tracheobronchial lymphadenopathy, tuberculous or otherwise, is described as a "whispered sound following the spoken voice and heard over the spinous processes." D'Espine believed that the bronchial character of the spoken voice did not normally extend below the seventh cervical spine. From a study of the 118 private office patients between the ages of two and fourteen years, Morse concluded that when there was no whispering voice sound after the spoken voice, when the bronchial voice, whisper, and respiration and the spinal dulness did not extend below the seventh cervical spine, and when there was no interscapular dulness, conditions were normal. Interscapular dulness was a definite indication of abnormality. The whispering sound after the spoken voice, D Espine's sign, was often the earliest and only evidence of abnormality. (In the discussion following this paper, Dr. C. H. Smith suggested abandoning the use of the expressions positive and negative D'Espine's sign, substituting "whispered voice extends to the first cervical vertebra, etc.").—*D'Espine's and Allied Signs in Childhood, J. L. Morse, Archives of Pediatrics, June, 1922, xxxix, 355.*

Pirquet Reaction in Diagnosis and Prognosis of Tuberculosis in Childhood.—Hamburger and Naegeli state that the Pirquet reaction indicates that the whole population of the big centres of Europe without exception undergoes tuberculous infection in the first twelve years of their life. This view prevailed until quite recently. Czerny and Moro in the last few years showed that universal infection by tubercle bacilli is a myth and that, based on the cutaneous reaction, in over 7000 cases only 2.5 per cent in the first year, 23 per cent in the second year, 25 per cent in the second to fourth year and 40 to 60 per cent in the tenth to fourteenth year showed infection. The Pirquet reaction is not applicable in cases of miliary tuberculosis, tuberculous and non-tuberculous cachexia, measles, influenza, pneumonia and previous treatment with large doses of tuberculin. Undernourishment during the last war also exerted a marked influence on the cutaneous reaction, since the skin loses part of its natural response to tuberculosis and, instead of allergy, anergy took place. This has been proved repeatedly to be the fact since with the improvement of the food situation in Germany the previously negative cases become positive without any change in clinical condition. In negative cases of Pirquet reaction the intracutaneous method of tuberculin injection should be used. For the cutaneous method Moro's tuberculin should be preferred to O. T.; its consistence enables the droplet to adhere more firmly to the punctured skin and it also contains bovine tuberculin. In 858 children from the children's hospital of Barmen, where many tuberculous suspects are admitted, the results of positive Pirquets corresponded very closely to those given above. All tests were performed twice, and when negative were followed by Hamburger's puncture reaction test or subcutaneous injection of from 1–0.1 mgm. O. T. The puncture reaction test increases the percentage of positives 10 to 15 per cent. Another series of 626 cases from orphan asylums showed only one-third of

all the children of ages 1 to 14 reacting positively to tuberculin (Pirquet, puncture reaction and intracutaneous method). Guarding of the infant against primary infection and the child against developing a constitutional susceptibility tending to lower his resistance should be undertaken. As far as the prognostic value of the Pirquet reaction is concerned, many infants under one year, giving a positive reaction, develop into strong and healthy children. Strong initial reactions with O. T. (intracutaneous method), as well as an increase in reaction upon repeated inoculation at intervals of eight days, indicate powerful antibody formation and should be regarded as very favorable from a prognostic point of view. Decrease in the cutaneous reaction or total disappearance should be taken as of ominous significance.—*Über die Bedeutung der Pirquetschen cutanreaction für die Diagnose und Prognose der Tuberkulose in Kindesalter, T. Hoffa, Klin. Wcnhschr., April 22, 1922, i, 855.*

Intracutaneous Tuberculin Test in Terminal Tuberculosis.—In order to determine whether or not skin hypersensitiveness to tuberculin is, as is commonly supposed, lost in the presence of an overwhelming tuberculous infection, the authors report the results of their observations on 143 cases of miliary tuberculosis with meningitis and 40 cases of miliary tuberculosis without meningitis. It is significant that most of the tests were performed and the reactions obtained during the four days prior to death. The following conclusions were reached: 1. In miliary tuberculosis and tuberculous meningitis in infants and children the Pirquet cutaneous test was positive in just over 50 per cent of the cases. 2. Failure to react to the Pirquet test in miliary tuberculosis and tuberculous meningitis does not mean a loss but only a depression of skin sensitiveness to tuberculin. 3. The tuberculin test is quantitative, and the Pirquet cutaneous test is equivalent to about 0.01 mgm. tuberculin given intracutaneously. 4. The intracutaneous test is more sensitive, and as opposed to the Pirquet test it not only affords a method of accurately measuring the amount of tuberculin given, but enables one to increase the amount at will. 5. If a high enough concentration of tuberculin is given intracutaneously, a positive reaction will be obtained in practically all cases of tuberculosis.—*The Value of the Intracutaneous Tuberculin Test in Extensive Tuberculosis, W. M. Happ and H. R. Casparis, Am. J. Dis. Child., June, 1922, xxiii, 527.*

Negative Tuberculin Reactions in Pulmonary Affections of Children.—Positive cutaneous and intracutaneous tuberculin reactions are very common in children. They indicate a state of allergy, but give no information as to the extent, degree or activity of tuberculous lesions. Except in the very young infants, where bacillary infection is recent and almost always in process of evolution, the test is of little diagnostic value. Negative reactions are much more unusual and for that reason may have diagnostic value. However, they may occur in the tuberculous in the following circumstances: the preallergic period of bacillary invasion, demonstrated in the case of children of tuberculous mothers by separating the children from the mothers and performing serial tests; in anergic states, in the course of tuberculosis observed in cachectic states and acute forms of tuberculosis (this is not invariably the case however) and during certain intercurrent infections, such as measles, influenza, typhoid fever and pneumonia. In nontuberculous, apparently healthy children the proportion of negative reactions to tuberculin decreases as age increases; at the age of 2 to 4 years, between 49 and 87 per cent, and at the age of 11 to 14 years, between 6 and 45 per cent are negative. Negative cutaneous reactions to tuberculin are of great value in eliminating the diagnosis of tuberculosis, therefore, as an etiological factor in various obscure affections. It is necessary, however, that the tuberculin shall have been tested, and it is also well to make a series of tests to eliminate the possibility of a preallergic period or a temporary anergic state. The following observations concern only affections of the respiratory tract: 1. A boy of ten years was admitted on the sixth day of a mild typhoid fever, with a positive Widal reaction and was afebrile by the twentieth day; from the beginning he showed signs interpreted as indicative of tracheobronchial adenopathy and congestion of the right apex. A series of cutaneous tuberculin reactions, the first on the eighth day of the disease and the last on the twenty-seventh day of apyrexia, were all negative. Fourteen days after discharge, the child was readmitted with acute articular rheumatism, complicated by endocarditis; the cutaneous test was still negative and, therefore, it was possible to regard this child as free of all tuberculous infection and to attribute his tracheobronchial adenopathy, the signs of which had disappeared, to typhoid fever. 2. A patient, with syphilitic stigmata and a strongly positive Wassermann reaction showed hypertrophied tonsils and adenoids

and very marked tracheobronchial adenopathy, revealed by physical signs and radioscopy; three cutaneous tuberculin tests at ten day intervals were negative. Specific treatment of the syphilis, together with removal of the tonsils, caused the signs of adenopathy to diminish. It is well to bear in mind the possible rôle of hereditary syphilis in tracheobronchial adenopathy. Chronic or repeated simple respiratory infections may also give rise to this adenopathy. In children taken at large who showed evidence of tracheobronchial adenopathy, tuberculin reactions have been negative in 35 per cent; in those with associated adenoid vegetations in 57 per cent. Therefore, adenoid vegetations should not be regarded as a tuberculous manifestation or tracheobronchial adenopathy as necessarily of tuberculous nature. Two cases are cited of children who were habitual coughers and in whom a diagnosis of bronchopulmonary sclerosis and bronchial dilatation was made. The first proved to be a hereditary syphilitic, the other had hypertrophied adenoids and tonsils, and both reacted negatively to tuberculin. Repeated infections of pharyngeal foci show a tendency to descend and to result in hypertrophy of the tracheobronchial nodes. The cutaneous tuberculin reaction may also be of value in the course of the pseudotuberculous bronchopneumonia which may complicate or follow measles and whooping cough, as described by Hutinel. Negative cutaneous tests properly performed permit us to eliminate tuberculosis, but it is well understood that a positive skin reaction by no means allows us to affirm that a given pulmonary condition is of tuberculous nature. Tuberculosis is indeed a scourge of childhood, a cause of numerous affections, especially of the respiratory tract, but there are also other etiological factors which may simulate its clinical course very closely. In practice they are difficult to differentiate and here the tuberculin reactions render great service, if one knows how to apply and interpret them.—*Les réactions négatives a la tuberculine dans les pneumopathies des enfants, Nobécourt, Le Prog. Méd., January 21, 1922, no. 3, p. 28.*

Basal Fibrosis of Lungs in Children.—This condition has been variously described under such names as basal pneumonic residues, fibroid disease, nontuberculous pulmonary fibrosis, chronic interstitial pneumonia or sometimes bronchiolectasis. Because of the physical signs, including persistent râles, it may be confused with tuberculosis. The radiogram may show an increased instead of a reduced translucency in the involved region, and there may be displacement of the heart toward the affected side, and alteration of the normal trunks and linear markings with fibrous peribronchial deposits near the hilum and slight dilatation of the bronchioles. It is probable that the normal shadows of fibrous tissues are not seen because the surrounding lung parenchyma is avascular, emphysematous, edematous or in some other state which renders it unusally translucent.—*Basal Fibrosis in Children, G. T. Herbert, Lancet, June, 10, 1922, ccii, 1145.*

Etiology and Prognosis of Pleurisy with Effusion in Children.—Fifty per cent of adults who have pleurisy with effusion develop active pulmonary tuberculosis, mostly during the first five years following the attack of pleurisy. Does pleurisy with effusion in childhood have the same etiology and does it pursue the same course as in adults? This question the authors discuss in detail from their series of 45 cases, collected and followed from 1907 to date. It is difficult to decide whether an effusion is tuberculous or not. Direct smear of the centrifugated specimen is rarely positive for tubercle bacilli; animal inoculation is also not conclusive when the results are negative. When a pleurisy follows a tuberculous process in the subpleural lung tissue then tubercles are not present on the pleura, which may be inflamed and the direct cause of the exudate and bacilli in such a case will be wholly lacking in the fluid. The method that Neuland employed to determine the tuberculous etiology of his cases was to follow up history of the case and make intracutaneous tuberculin injections and Pirquet tests. These tests were done on 45 children with pleurisy who ranged from one to fourteen years in age. Ten of them reacted negatively to tuberculin. Wildbolz's urine test was tried only on 5 cases with negative results. Twenty-nine patients of the series were observed from one to ten years after the onset of the disease: 24 of them had a positive Pirquet test at the time they first had their exudate. Of these 24 patients, 18 recovered and were in perfect physical condition, while 2 showed active pulmonary tuberculosis after two or three years, one developed Pott's disease and 2 showed very doubtful physical findings in the lungs but without any clinical manifestation. Some of these children had measles and influenza. In view of these findings it is concluded that quite a proportion of these cases are not tuberculous in origin and that the prognosis of pleurisy with effusion in childhood is infinitely better than in adults. —*Aetiologie und Prognose der serösen pleuritis*

beim Kinde, W. Neuland, Klin. Wchnschr., March 4, 1922, i, 470.

Diagnosis of Early Hip Joint Disease in Childhood.—Tuberculosis of the bones and joints prior to two years of age is rare. The greatest incidence is from two to fifteen years. The ends of the long bones are most commonly involved because of their greater vascularity, thus making injury more frequent. The more rigid supervision of the milk supply has decreased the danger of tuberculous infection in childhood. Intermittent limp, muscle spasm, limitation of motion, muscle atrophy, apparent lengthening or shortening,—any or all of these may occur during the first week. Pain in the region of the obturator nerve is a common but later manifestation. X-ray is less important than clinical examination. The usual picture is absorption of bone. Tapping the sole to elicit pain in the hip is condemned as likely to cause local damage. Differentiation must be made from rheumatism, acute synovitis, various forms of genital irritation, acute epiphysitis (pyogenic), acute rickets, scurvy, and finally tuberculosis of the spine. —*The Diagnosis and Differential Diagnosis of Early Hip Joint Disease in Childhood, J. T. Rugh, Arch. Pediat., May, 1922, xxxix, 323.*

Progress in Bone and Surgical Tuberculosis.—Supervision of the milk supply in larger cities is given credit for much of the decrease in the number of cases of this form of tuberculosis, the bovine type of tubercle bacillus being responsible for the disease in many instances. Willard emphasizes clinical over X-ray diagnosis in the earlier stages of bone tuberculosis. Fixation and heliotherapy are the most important therapeutic agents. X-ray (if filtered through heavy aluminum to prevent burns) is given tentatively favorable consideration. Tuberculin is believed to be of no value.—*Progress in bone and Surgical Tuberculosis, DeF. Willard, Archiv. Pediatr., May. 1922, xxxix, 327.*

Prognosis and Treatment of Tuberculosis in Infancy and Childhood.—Tuberculosis in early life may cause considerable fever with little leucocytosis or polynucleosis. There is but little emaciation. The lower lobes are more likely to be involved than the apices. Therapeutic measures recommended are (1) outdoor air, twenty-four hours a day, cold if possible, (2) heliotherapy (the author noted no bad effects on pulmonary cases in this country, such as those mentiond by Rollier in Switzerland), (3) codliver oil, and (4) full diet and prolonged complete rest. Tuberculosis in infancy, if localized, might be cured by prompt interference. It it had involved the lungs it rapidly became a general tuberculosis, with an absolutely bad prognosis. In the author's opinion, rapid emaciation makes against, rather than for, a diagnosis of tuberculosis in infancy or early childhood.—*Prognosis and Treatment of Tuberculosis in Infancy and Childhood, R. G. Freeman, Archiv. Pediatr., June, 1922, xxxix, 403.*

Nontuberculous Disease of Bronchial Lymph Nodes in Children.—A survey of the literature brings out the following facts regarding lymphoid tissue: 1. Lymphoid tissue is strikingly predominant in childhood. 2. The activity of the tissues can be judged by the presence of the germinal centres which are rarely absent during this period. 3. Enlargement of the lymph nodes in the child is so common as to be almost constantly demonstrable. 4. Bacteria, in a latent stage, are present in many of these nodes. 5. The virulence of these organisms is frequently attenuated. Literature on nontuberculous infections of the bronchial lymph nodes is scant and clinically the picture has never been clearly defined. This is an effort, therefore, to describe the condition more accurately. Next to symptoms, physical signs are of importance. Among the latter the more valuable are d'Espine's sign, dulness and altered breathing in the interscapular areas, dulness in the superior sternal regions, including the sternoclavicular articulations, and dulness and altered breathing in the regions to the right and left of the sternum between the clavicle above and the third rib below. Roentgen ray examination is of less importance than either the history or the physical examination; but as an adjuvant its value cannot be overestimated. *Conclusions*: 1. Simple bronchial lymphadenitis, acute, subacute or chronic, is a distinct clinical entity in childhood. 2. It may be divided into five definite types, based on the clinical history and cardinal symptoms: (1) malnutrition type, (2) subacute bronchitis type, (3) pertussoid type, (4) chronic febrile type and (5) asthmatic type. 3. When one considers the great incidence of respiratory infection to which bronchial lymphadenitis is secondary, the general conclusion can be reached that this type of disease, in contrast to tuberculosis, is the most common disease of the bronchial lymph nodes. 4. The diagnosis must be made by a combined consideration of the history, physical signs and roentgen ray interpretations. 5. The most important question for differential diagnosis is the possible presence of tuberculosis which can

be established by the use of tuberculin. 6. The treatment may be briefly summarized under the three heads of rest, fresh air and diet. 7. With accuracy in diagnosis and careful observation in the details of treatment, the prognosis is invariably good, unless a secondary infection takes place with the tubercle bacillus.—*Bronchial Lymphadenopathy, Nontuberculous, E. C. Fleischner, J. Am. M. Ass., July 15, 1922, lxxix, 175.*

Significance of Laboratory Findings in Prognosis of Tuberculosis in Childhood.—The value of laboratory methods depends in no small part upon the fact that they are based on objective rather than subjective findings. Some of the newer methods were applied to 100 cases of tuberculosis of all types, in an effort to tell whether or not the laboratory could aid in establishing the prognosis. By means of the Abbe refractometer, the protein content of the blood was estimated and its variations followed during the course of the illness. Observations were also made on the specific gravity of the blood, hemoglobin content, red and white cells, and differential count. The urine was examined for the presence or absence of the diazo reaction, Weiss permanganate reaction, Russo methylene blue reaction, urobilin and urobilinogen. It was found that in those cases with good prognosis the refractometric index rose to normal or remained above normal, whereas in those with bad prognosis it fell steadily below the normal and remained there. The percentage of hemoglobin was higher in proportion than the red cell count, but neither were as low as the pale, anemic color of the patient would lead one to believe. A steady fall in the hemoglobin was of rather bad prognostic import. The white cell count is influenced by mixed infections and secondary complications, but, in general, cases with a relative lymphocytosis gave a good prognosis and those cases which terminated fatally showed a constant drop in the lymphocytes. The eosinophiles showed an exactly similar behavior, these cells disappearing from the blood in cases with a bad prognosis. The diazo reaction was found to be of great significance, as it gave correct forecasts in 27 out of 30 cases. The Weiss permanganate reaction and the Russo methylenblue reactions were not found of value. Urobilin and urobilinogen may occur in the urine during a prolonged fever and be of no great significance as regards prognosis, but in general the constant presence of these substances in the urine of a patient with little or no fever suggests a bad prognosis.—*Über die Bedeutung von Laboratoriumsmethoden für die Prognosestellung bei Kindertuberkulose, F. X. Cieszynski, Monatschr. f. Kinderhk., xxii, February, 1922, 663.*

Prophylactic Measures Against Tuberculous Infection of Children.—The measures were (1) in some cases entire removal of the children from the house inhabited by the tuberculous adult; (2) isolating the tuberculous patient in the house; and (3) removing the sick from the house. The first measure proved successful in 103 cases; the second in 536; the third in 70 cases. These measures for some reason or other were not possible of application in 167 cases. The results were unknown in 63 cases. It was found that often, in the same family, all three methods of prophylaxis had to be applied, because of themselves two were not successful. Even the adoption of these precautions are often of but little avail and considerable improvement is required. It is only by an educational campaign initiated in the schools, and impressing the dangers of droplet, contact and dust infection as well as enforcing a rigid anticough and antispitting discipline, that a marked decreased rate of incidence among the young can be expected.—*Ist es möglich, in den Haushaltungen minderbemittelter offener Tuberkulöser die Kinder vor Ansteckung zu schützen? Braeuning and Hollmann, Zeitschr. f. Tuberk., May, 1922, xxxvi, 255.*

Lymphangitis in Cattle Caused by Acid-Alcohol-Fast Bacillus.—For several years this subject has been studied by Traum. It had been previously indicated that this disease resembles tuberculosis in the character of the lesions and the presence of acid-fast bacteria in the lesions, and that it further resembles tuberculosis by the large percentage of cases that give positive reactions to the intracutaneous tuberculin test. It has, however, been satisfactorily demonstrated that the disease is not mammalian tuberculosis, through the failure to produce a single case of tuberculosis in the large number of guinea pigs inoculated. The disease must receive important attention in tuberculosis eradication work, especially on account of the fact that a large percentage of cases do react to intracutaneous tuberculin tests. In the Star Valley country, Wyoming, about 6000 cattle were tested by the United States Bureau of Animal Industry, with the result that a little over 3 per cent reacted to the test. Forty-five of the reactors were slaughtered at Ogden, Utah, and the only lesions found in 27 of them were a few "enlarged lymphatic skin glands." Materials from 3 more cases were available for study; one, a definite reactor to the intracutaneous tuberculin test, September, 1920,

showed a conglomerate mass of nodules, 4.5 × 3.5 inches, on the outside of the upper two-thirds of the left radius. On microscopic examination smears showed a fairly large number of acid-alcohol-fast bacilli varying in size and shape. Many were 3 to 3.5 μ long, with irregular and heavier ends; others small, coccoid, oval and kidney-shaped. In some fields the bacteria were found in masses. Three guinea pigs and one rabbit inoculated with this material remained normal. Sixteen inoculated tubes and petri dishes, containing various culture media, developed nothing of diagnostic value. Twelve remained sterile, 3 showed each a subtilis colony, and the fourth a large gram-positive coccus. Subsequent to removal of the lesions from this cow, she gave negative results to the subcutaneous and intracutaneous tuberculin tests. The latter was applied in April, 1921. The second case, a nonreactor to the intracutaneous tuberculin test, showed a number of short, kidney-shaped acid-alcohol-fast bacilli in the cheesy, clay-like and in part glutinous pus from a removed nodule. Cultures and animal inoculations from this case were negative, except that a young rabbit inoculated with part of this material showed at the end of ten days a nodular mass which, upon microscopic examination, proved to contain large numbers of acid-alcohol-fast bacilli. The third case showed a slight induration following the intracutaneous test, not, however, sufficiently large to be classed in official State testing as a reactor. This cow showed a large number of cutaneous and subcutaneous nodules on both front legs and on the right chest wall. A very few, indistinct acid-fast rods were observed from a large number of smears made from the contents and walls of the nodules. Animal inoculation to date has produced nothing of diagnostic value. Of an exceedingly large number of culture inoculations, only a few colonies of a nonpathogenic diphtheroid were found.—*Lymphangitis in Cattle Caused by Acid-Alcohol-Fast Organism, Annual Report of Division of Veterinary Science, College of Agriculture, University of California, Reprinted from Report of the College of Agriculture and the Agricultural Experiment Station of the University of California, from July 1, 1920, to June 30, 1921, p. 5.*

Normal Temperature of Domestic Fowl.—This study will be of interest to those interested in experimental and avian tuberculosis. The cloacal temperatures of three lots of adult fowls are summarized. There is apparently no difference between those of males and females. The temperature is highest at night. After the fowl goes to perch it gradually falls, till at midnight all surplus body heat is apparently eliminated and the average falls to 104.5°F. Toward dawn the birds become restless and, as they begin to move about, surplus heat accumulates. At this time the average was 105.7°. From this time till noon the temperature gradually rose to 106.6° and by 5 P.M. had reached 106.9°. Since the temperatures were taken during the month of February, the fowls were not subjected to high atmospheric temperatures and as a result the temperatures are slightly lower than some which have been given. The average daylight temperature of the fowls was approximately 106.8°, or 0.6° lower than the average given by all other authors. From all studies recorded it would appear that 107.3°F. is an annual approximate temperature, while this is likely to be slightly higher during warmer weather and lower during colder weather.—*Normal Temperature of the Adult Domestic Fowl, B. F. Kaupp, J. Amer. Vet. Med. Ass., August, 1922, lxi, new series xiv, 520.*

Effect of Pleural Exudates upon Plumonary Tuberculosis.—The cutaneous reaction is negative in the majority of cases of pulmonary tuberculosis with exudative pleuritis and the resistance of the body to tuberculosis is diminished. The cutaneous reaction in cases with exudate due to artificial pneumothorax is positive, although not so much so as in cases without pleuritis. After disappearance of the pleurisy some patients show symptomatic improvement, but the greater number become worse. The changed condition is not related to the amount and site of the exudate or the stage of the pulmonary disease. The late statistics in pleurisy cases is unfavorable. The prognosis is determined more by the character of the pulmonary process and the resistance of the body.—*Über die Einwirkung von Pleuraexsudaten auf die Lungentuberkulose, O. Országh, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix, 194.*

Pulmonary Sclerosis and Fibrous Tuberculosis.—It is common to call by the name of fibrous tuberculosis any fibrocaseous nodular infiltration with a fibrous tendency, although the gross lesions are in reality the outcome of very different processes. This conception does not suffice, nor is it a correct one. Fibrous tuberculosis in its varying degrees and different forms is a disease as frequent in occurrence as it is little known and rarely diagnosed. *Evolution:* Very prolonged observation of the same patient is indispensable in forming an idea of the progression of these lung scleroses from a diffuse slight fibrosis to characteristic and

open fibrous disease. General symptoms of intoxication, very often gastro-intestinal, obscure the picture. Locally, the condition is limited to various combinations of sclerosis and emphysema, the extent and nature of which are established by radiography. Bacilli are not to be found during the periods of slow evolution, which may take as long as twenty to thirty years. Then some day or other, the state of affairs declares itself by pleurisy, hemoptysis or a definite localization. Summed up, the progression is so slow that it suggests a symbiosis rather than an infectious disease. *Diagnosis:* Because of the absence of secretion the stethoscope reveals no adventitious sounds. Other abnormalities of sound may exist, but again there may be gross fibrous lesions with nothing abnormal to the ear. Sclerosis is always accompanied by atrophic emphysema of varying degree, and, in consequence, there is a superimposing of signs. To the stethoscope there may be a condensation with sclerosis predominating, or rarefaction with emphysema to the fore. But the diagnosis of fibrous tuberculosis is made neither by physical signs nor bacteriologically, except perhaps secondarily; it is made with the X-ray, and easily so when all other evidence may be lacking. Furthermore, the X-ray enables one to determine the extent of the lesion as well as to make the diagnosis in a relatively early stage. *Pathological anatomy:* Assuming that the infection remains localized in hilum or mesenteric nodes, exclusively or over a long period, there occurs, generally speaking, an emanation of diffusible sclerogenic toxins from the focus. These toxins may cause sclerotic processes in the immediate neighborhood (perinodular scleroses in the classic fibrous case, or pleurisy), or more remotely and diffusely (toxic rheumatisms of Poncet, old sclerotic processes in various organs such as intestine, liver, heart and particularly the kidney). The diffuse sclerosis once established is followed by a chronic inflammatory state due to tissue alterations, and from the latter result destructive emphysema, repeated attackes of bronchitis and finally bronchial dilatations, all of them results and not causes. With time, this sclerotic stage is passed and the tuberculous focus will have been the source of tubercle formation. Tuberculous nodules are formed and the sclerotic process of the particular area is further increased. These nodules may remain shut off or may be evacuated by way of the bronchi. In either event, the case will have entered imperceptibly into the stage of what is termed fibrous tuberculosis. Three brief histories are given of patients under observation for many years.—*Sclérose pulmonaire et tuberculose fibreuse, F. Dumarest, Ann. de Méd., March, 1922, xi, 219.*

Causes of Death in Pulmonary Tuberculosis with Cavities.—This communication is based on two years' observations of 183 deaths at the Salpêtrière, in which the mode of death was observed clinically and causes determined at autopsy. In only 2 instances was death caused by a fulminating hemoptysis. Death by asphyxia was the rule (163 cases). Sometimes the asphyxia supervened suddenly, in which cases areas of congestion or terminal edema were noted at autopsy. In 11 cases death followed accidental pneumothorax and in 3 cases pleurisies; while in the remaining cases, cachexia and anasarca, hepatic insufficiency and progressive anemia, due to small repeated hemoptyses, played the final rôle.—*Comment meurent les tuberculeuxe cavitaires, Crouzon, Marcerou and Grenaudier, Meeting, Société médicale des Hôpitaux, February 24, 1922, reported in Le Prog. Méd., March 4, 1922, no. 9, p. 107.*

Undetermined Nodular Process in Lungs.—A case of primary, chronic, nodule-forming inflammation, localized in the centre of the lung, of unknown etiology, is reported. The patient had cough, fever and pains in the back, the cough persisting two years, and difficulty in respiration developing. The findings were an irregular but sharply defined central nodule in each lung. In spite of a gain in weight of 3.5 kilos, the findings remained unchanged. All other findings for tuberculosis, lues, ecchinococcus, streptothrix, etc., were negative. The process differed from fibrous pneumonia because of the absence of contractions, bronchiectasis or abscess formation.—*Zur Klinik unklarer chronischer Lungenprozesse, H. Gerhartz, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 354.*

Foreign Bodies in Bronchi.—Five cases are reported in which foreign bodies gained access to the bronchi during dental work. *Conclusions*: 1. Bronchoscopy early or late in all doubtful cases of possible foreign body inhalation following dental work under general anesthesia is indicated for diagnostic purposes. 2. While cough, dyspnea, asthmatic wheeze and pain in the chest may be present as symptoms at once, they may be absent and the foreign body may be expelled or found by X-ray. 3. Endoscopic treatment is indicated when abscess of bronchiectasis is present.—*Bronchoscopic Cases of Dental Origin, H. H. Forbes, N. York M. J. and Med. Rec., June 21, 1922, cxv, 738.*

Diaphragm Irregularities.—In a large series of miscellaneous cases, studied at Camp Lewis, the roentgenograms showed diaphragmatic irregularities in 4 per cent.

These were interpreted as being due to pleurodiaphragmatic adhesions, until it was discovered that many of them disappeared after varying intervals. To explain the phenomenon, therefore, a theory suggested itself by which it is assumed that the irregularities are due to dimpling of the lungs and that the diaphragm is held in contact with the dimples by the normal negative intrathoracic pressure. The dimpling is supposedly due to a loss of elasticity of the bronchi which fail to stretch normally as the lung expands and consequently hold back a contiguous area of lung, the extent of which depends on whether large or smaller bronchi are involved. The irregularities are seen most often at the termini of bronchial trunks and appear to be more marked in the asthenic types, in which the diaphragm has undergone atrophy and suffered loss of tone as has the other musculature. They are designated pseudo-adhesions. In one case showing such an irregularity the autopsy revealed a smooth diaphragm; and in eight cases treated by artificial pneumothorax the irregularites appeared to be due to pseudo-adhesions in six. Where the irregularities are diffuse, not clear cut and not closely related to the bronchial ramifications and not following the anatomic course of the bronchi, they appear to be due to pleurodiaphragmatic adhesions. An apparatus was devised, reproducing roughly the functioning chest, a sheep's lung being held outside a bell jar. After the lung was expanded by exhausting air from the jar, traction was made on a bronchus by a barbed wire, previously fixed in the desired location. This produced a dimpling, which increased with further expansion of the lung and which was increased and diminished by manipulation of the artificial rubber diaphragm, simulating inspiration and expiration. The size of the dimple depended upon whether the barb was imbedded remotely from the finest ramifications, thus fixing a large area of lung surface, served by that portion of the bronchus which came off distal to the barb and producing a large dimple, or if the barb was imbedded in the terminal bronchus the dimple was correspondingly smaller. It was not possible with this apparatus to reproduce tenting of the diaphragm. *Conclusions*: 1. The assumption that tenting of the diaphragm always diagnosticates pleurodiaphragmatic adhesions is unjustifiable. 2. Tentings of the diaphragm, frequently seen on plate and screen at the termination of the hila-diaphragm superficies with characteristics which are associated with pseudo-adhesions, are purely physical phenomena brought about by two factors: (a) During inspiration the diminished elasticity or rigidity of the lower bronchial branches prevent descent of that area of the lung base in immediate relationship to the bronchus involved; thus a dimple effect is produced on the surface of the base of the lung. (b) The diaphragm, being molded to the base of the lung by a negative intrathoracic pressure, is held by suction in the dimple above referred to, producing a tented appearance (pseudo-adhesion). 3. Diaphragm irregularities of the pseudo-adhesion type are commonly found during the course of acute and chronic respiratory infections. In acute respiratory infections with peribronchial infiltration involving the lower bronchial branches the irregularity disappears with restoration to normal. In chronic respiratory infections with consequent connective tissue proliferative changes in the lower bronchial ramifications, the irregularity appears to be permanent in nature. 4. It is reasonable to suppose that should infiltrative or proliferative changes incident to infection not halt at a point in the bronchial tree proximal to its termination but, instead, proceed to the pleura, then the diaphragm would become adherent and the pseudo-adhesion would be converted into a true adhesion.—*Diaphragm Irregularities (Preliminary Contribution), R. C. Matson, Am. J. M. Sci., June, 1922, clxiii, 826.*

Splénopneumonie of Grancher.—So called *splénopneumonie*, first described by Grancher, is not a rare condition and deserves more attention from clinicians. It is a sort of subacute pneumonia simulating pleurisy with effusion, yet without any fluid in the chest. Seven of these cases were found during a short time: 3 had been erroneously diagnosed as serofibrinous pleurisy, 3 as extensions of active pulmonary tuberculosis, and 2 as subdiaphragmatic abscess. In the 3 cases occurring in patients with old histories pointing to tuberculosis, no tubercle bacilli were ever found in the sputum, and the pneumonia was therefore not to be explained on the grounds of tuberculosis.—*Fréquence de la spléno-pneumonie. Ses rapports avec les épanchement pleuraux, les collections sous-diaphragmatiques et la tuberculose pulmonaire, A. Pellé, Ann. de Méd., April, 1922, xi, 500.*

Concepts of Immunity to Tuberculosis.—Owing to the fact that our conception of the term *immunity* is that of a well defined specific insusceptibility to disease and since no such condition exists in tuberculosis the writer recommends a more suitable term, such as Petruschky's *epidemic resistance* (*Durchseuchungsresistenz*), or Hayek's *immunobiological condition of resistance* (*immuno-*

biologisches Kröfteverhältniss). The term *immunobiological* embraces all aspects of life that have to do with the power of resistance which an infected body must possess against the invading microörganism. The term *serological* is only a partial aspect of this phenomenon. The condition of hypersensitiveness to tuberculin which exists in the earlier chronic forms of tuberculous infection is a typical concomitant of a thorough epidemic resistance. In the healing stage of tertiary tuberculosis hypersensitiveness passes gradually into relative asensitivity. This latter must not, however, be looked upon as a diminution of the resisting power of the body to tuberculosis, but rather as a heightened ability to overcome, without evidence of a reaction, the reacting substances of the tuberculin. There can be little doubt that there are definite biological laws that will account for the action of these specific reacting bodies upon the tuberculous organism. These laws, however, still remain to be discovered.—*Tuberkuloseimmunität im Theorie und Praxis, H. von Hayek, Ztschr. f. Tuberk., March, 1922, xxxv, 424.*

Allergy and Anergy.—Only the primary cellular manifestations should be called allergic reactions. However, those secondary manifestations of allergy which are dependent upon the immunobiological accomplishment of the primary manifestations and are designated as general reactions must be called symptoms of "relative anergy."—*Allergie oder Anergie? E. Szász, Ztschr. f. Tuberk., January, 1922, xxxv, 321.*

Healing of Tuberculosis and Effect on Allergy and Immunity.—As a result of studies by Naegeli and Hauser it is concluded that there is both bacteriological and anatomic healing of tuberculosis (with disappearance of all tubercle bacilli) and that this occurs fairly frequently. Cases of clinically healed tuberculosis lose their power to give a general reaction to even 200 to 450 mgm. tuberculin. Anergy can result from an overproduction of antibodies which can neutralize extremely large amounts of tuberculin. It can occur during cachexia and disturbances of the reacting power during pregnancy and after certain diseases (measles, influenza, etc.). After complete anatomic and bacteriological healing of tuberculosis there can be an absence of tuberculin hypersensitiveness, but there is also no immunity. The results of tuberculin therapy, and probably many other methods of treatment, are to be attributed to focal reactions. With the death of the tubercle bacillus, that is, with the anatomic-bacteriological healing, everything associated with tuberculosis terminates. Basically, the author agrees with Wassermann, Neufeld and Selter's recently expressed views, but differs in the conception of the tuberculin reaction, which is believed to be of antigen-antibody nature, Selter regarding it a reaction of a specific irritant without antigenic properties.—*Gibt es eine Ausheilung der Tuberkulose? Bleibt danach Tuberkulinempfindlichkeit und Immunität zurück? Die Anergie als Antwort, C. Kraemer, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 239.*

Experimental Anaphylactic Shock by Inhalation.—Guinea pigs, sensitized to normal horse serum, were subjected to the action of homologous and heterologous antigens, introduced directly into the trachea or inhaled after pulverization. More or less intense anaphylaxis occurred after intratracheal injections of egg albumen or insufflations of dried powder of serum, egg albumen or peptone. Dusts, containing dried and powdered tubercle bacilli and subtilis, did not provoke shock like organic dusts or such inorganic dusts as those of starch, gum arabic, marshsmallow or talcum. Anaphylactic shock by inhalation is sharper and more rapid, inasmuch as the antigen is in a more readily absorbable form. Anaphylaxis of respiratory origin is not specific and not localized to the respiratory tract, but affects the whole body and is accompanied by blood vascular phenomena.—*Choc anaphylactique expérimental par la voie respiratoire, F. Arloing and L. Langeron, Meeting of Academie de Médecine, June 6, 1922, reported in Le Prog. Méd., June 24, 1922, no. 25, 296.*

Pirquet Reaction and Vasomotor Irritability.—The Pirquet reaction is an expression of the irritability of the skin, which is dependent upon vasomotor irritability and is increased by increasing the irritability of the vegetative nervous system (thyroid gland) as also the skin hypersensitiveness (sulphur ointment). As the Basedow case is hypersensitive to iodine administration so the tuberculosis case is to tuberculin. Tuberculin therapy is an irritation therapy.—*Die Bedeutung der vasomotorischen Erregbarkeit der Haut für den Ausfall der Pirquetschen Cutanreaktion als Ausdruck eines spezifischen und unspezifischen "Reizzustandes" des Körpers, Röckemann, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 301.*

Immunization of Rats and Mice against Tuberculosis. Rats and mice (naturally resistant to tuberculosis) were immunized with four constituents of human tubercle bacilli. (1) lipoidal substance,

(2) histon, (3) nucleoprotein, and (4) nucleic acid. They were then given intraäbdominal inoculations of living human and bovine bacilli. The immunized animals disposed of the tubercle bacilli earlier than the controls. This action is attributed to the increased phagocytosis of the omentum, Raynaud's nodes, the lymphatic nodes and the visceral cells, which play a significant and important part in natural immunization.—*Experimental Investigation on Immunization against Tuberculosis, II. Yoshimasa Watanabe (Saikingaku Zasshi, August, 1921, no. 311), Abstract from Japan Medical World, January 15, 1922, ii, 16.*

Immunity of Rat to Tuberculosis.—An attempt was made to discover the cause of the resistance of the rat to tubercle bacilli of the human type. It is attributed not to blood constituents but to the living cells, especially the large mononuclear endothelial cells and the cells in the lymph nodes.—*Some Experimental Studies on Immmunization of Tuberculosis, Yoshimasa Watanabe (Tokyo Iji Shinshi, September, 1921, no. 2245), Abstract from Japan Medical World, February, 1922, ii, 44.*

Origin of Circulating Lymphocytes.—Ligation of the thoracic duct of the cat brought about an immediate decline of 56 per cent in the absolute lymphocyte count of the blood. After about three weeks the preoperative level was restored. It is probable that the return of lymphocytes to the blood took place with the establishement of a collateral circulation of the thoracic duct, although the latter has not been shown to have occurred. "It is definite that the thoracic duct is an important avenue for the entrance of small lymphocytes into the blood stream, and that it is the pathway through which at least half of the small lymphocytes reach the circulating blood in the cat."—*Changes in the Number of Small Lymphocytes of the Blood Following Ligation of the Thoracic Duct, F. C. Lee, J. Exp. Med., August, 1922, xxxci, 247.*

Leucocytes in Pulmonary Tuberculosis.—The leucocyte picture is a valuable mathematical expression of an important function of the entire body in pulmonary tuberculosis. Considered with temperature, body weight and other features, it is capable of indicating the general condition. The total leucocyte count alone gives no diagnostic or prognostic data. Differential study of the leucocyte picture gives valuable information. Lymphocytosis was found in the mild type of case tending to heal. Prognostically, this finding was favorable. Neutrophilia in the absence of complications characterized the severer cases and is of unfavorable prognostic import. In milder cases it can occur in hemoptysis or the presence of secondary abscess formation. Considerable shift of the leucocyte picture to the left was found mostly in the severe cases, in hemoptysis and in intercurrent febrile diseases. In a rapidly fatal case the shift to the left persisted to death. Eosinophilia, spontaneously or after tuberculin administration, was found in cases with a favorable course. With progressive healing the eosinophilia returns to normal values. Its absence is an unfavorable sign prognostically. In spontaneous changes, or reactions to tuberculin, the blood changes preceded the other findings.—*Über das weisse Blutbild und seine Änderungen im Verlaufe der Lungentuberkulose, Anna Kleemann, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix, 138.*

Biochemistry of Tuberculosis.—Two metabolic series are concerned in infection, that of the invading parasite and that of the host as modified by the former's action. Disease is the manifestation of the resulting alterations in the physiology of the host. The life processes of bacterial cells are probably as complicated as those of a liver or kidney cell or perhaps even one of the central nervous system. The value of the "saprophytes" in the cycle of life is pointed out and attention is called to a group that has slowly evolved from these, namely, the "parasites". The latter, besides being able to multiply in the tissues of the host, must multiply in such a place or manner that easy exit is afforded for escape to another host of the same sort. Among the nonuselful bacteria is the acid-fast group. Within it are several varieties including the tubercle bacilli, adapted to life in different hosts, and saprophytes, unable to maintain such existence although flourishing more or less widely outside. A definite relationship between these two forms, both biologically and chemically, is pointed out, particularly if dead cultures are being dealt with. But it is only with living material that one can positively say, "these are tubercle bacilli and these are something else in the acid-fast group." The former can live as parasites in an appropriate host; the latter cannot. The former also show characteristically different matabolism on ordinary culture media. The surest chemical (cultural) criterion for the tubercle bacillus is its marked glycerophilism, a distinction in carbon metabolism. To distinguish these groups on the basis of nitrogen metabolism is more difficult, yet some progress has been made along these

lines. Much of the natural resistance of the tubercle bacillus to digestion *intra vitam* has been attributed to its high wax content. But the avirulent acid-fasts have a high wax content too, although more of the wax is in the form of lipin in the tubercle bacillus. As the tubercle bacillus grows on a bouillon culture the diffusible molecules of the media are acted upon by certain enzymes; and ammonia, various acids from the amino acids and oxidation products of the carbohydrates are formed. Besides these simple substances, the media, freed from bacilli, now contain something which is poisonous to a tuberculous animal, something contributed by the bacilli from their own substance. Whether the active principle of such media (tuberculin) is protein in nature is still under discussion. Some investigators have shown that it is weakened or destroyed by the action of such proteolytic ferments as pepsin, trypsin and erepsin. Perhaps, when the problem is solved, it will be found that tuberculin is a polypeptid, an autolytic product of the tubercle bacillus, protein in its nature in that it is derived from protein, but not sufficiently complicated in its structures to give the usual protein tests. In discussing the altered physiology of the host, it is pointed out that caseation is the most characteristic lesion of tuberculosis. The caseous matter consists almost entirely of disintegrated preëxisting tissue, modified to a slight extent by slight autolysis and the introduction of a small amount of foreign protein and lipin from the bodies of tubercle bacilli. The cause of caseation is still unknown. The conditions of local anemia due to the pressure on the capillaries from proliferation of the fixed tissue cells (epithelioid) as a simple foreign body reaction is emphasized. Thus, favorable conditions for bacillary proliferation are established. The continued chemical *status quo* of the caseous material is more difficult to explain. Jobling and Petersen have shown that autolysis is inhibited by the soaps of unsaturated fatty acids and conclude that "the unsaturated fatty acids of the tubercle bacillus are an important factor in the failure of absorption of caseous tissue." The caseous mass contains specific and nonspecific elements so far as tuberculosis is concerned; first, tubercle bacilli, which, chemically considered, are foreign proteins whose continued presence renders the tissues of the host "sensitive" to the same material whether derived from within or without and, secondly, the tissue of the caseated area which is toxic *per se*. Krause has shown that an animal is poisoned by any tissue material which gets into its blood stream in large amount in unit time. On the periphery of each caseous mass a certain amount of this material must be swept into the circulation. Hence, the hyperemic focal reaction which follows the administration of tuberculin will favor absorption due to the increased circulation at that point. The toxemia of progressive tuberculosis seems to be largely nonspecific in character due to the absorption of disintegrating protein, but, aided by a factor which is quite specific in nature, namely, the focal inflammatory reaction to tuberculoprotein. The fever of such toxemia is probably due much more to the absorption of the proteins of the disintegrating caseous mass than to the protein of the tubercle bacillis. The effect of fever upon protein metabolism and nitrogen elimination is more complicated. It is concluded that, in progressive tuberculosis, the rate of metabolism is increased as a result of the operation of two factors, hyperthermia and the toxic effect of a foreign protein upon protoplasm. The second of these is more important in protein destruction, as hyperthermia *per se* does not increase nitrogen elimination in the normal subject. Impoverishment of the protein-sparing constituents of the tissues by fever, however, may result in protein being drawn upon to maintain the high level of total energy transformation. In afebrile tuberculosis such tissue destruction as does take place is probably the result of the action of some poison on the cells.—*The Biochemistry of Tuberculosis, E. R. Long, Bull. Johns Hop. Hosp., July, 1922, xxxiii, 246.*

Chlorine Metabolism in Pulmonary Tuberculosis.—There seems to be a parallel between the severity of pulmonary tuberculosis and hypochloremia. In not all cases with low chlorine blood content is there a diminished chlorine secretion; in the stomach, in some cases, there was a normal acidity, or even a hyperacidity after a Boas test breakfast, indicating that, broadly speaking, the chlorine of the blood is not the decisive factor in gastric secretion. It is only one of several factors. In cases with superacidity the explanation of there being a stimulation of the living gland cells by the toxins is far fetched. How does the hypochloremia occurs? In tuberculosis the chlorine mobilization is increased. The majority of cases show thyreo-toxic features. Since the gastric secretion is diminished early (a supersecretion probably proceding), the increased chlorine in the blood is excreted by the kidneys and thus removed from the body. Thus there occurs a paucity in body chlorine and hypochloremia. The cases, in which the gastric secretion is normal or increased with a low blood chlorine

content, are explained on the basis that the gastric cells are still irritable, while on the other hand the mobilization is so marked that in spite of this the blood chlorine not utilized by the gastric glands is eliminated by the kidneys. A second possible explanation for the hypochloremia may be sought in the fixation of the chlorine in certain depots. This can only be determined by chlorine determinations on tissues, which has thus far not been done. In order to obtain an insight into the intermediate sodium chloride metabolism in tuberculosis, cases free from kidney symptoms were examined for urinary sodium chloride excretion at two hour intervals. In mild cases the excretion was normal, while in severe cases a retention occurred, especially in the morning. The water excretion in moderately severe cases was normal. No sodium chloride retention occurs upon feeding 10 gm. of sodium chloride. In severe cases sodium chloride administered is excreted slowly, while liquid administered is excreted normally. In severe cases sodium chloride administered may be only partly eliminated, not even being excreted on the second day: there being a true retention, as high as 30 per cent (3 of 10 gm.) can be retained. It is concluded that there is a dechlorization and resulting chlorine starvation of the tissues in tuberculosis.—*Beitrag zur Kenntnis des Chlorstoffwechsels. IV. De Chlorstoffwechsel bei Lungentuberkulose, F. Boenheim, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix. 233.*

Deposition of Calcium Salts in Tuberculous Foci.—After the intravenous injection of calcium salts, it was found that small amounts settle in the lungs of the rabbit, more in pathological (tuberculous) foci than in the normal tissues, but not as much as might be expected.—*Chemical Examination of Calcium Salts That Have Been Infiltrated in the Tuberculous Foci by Injection.—Kyotaro Okamoto (Saikingaku Zasshi, November, 1921, 314), Abstract from Japan Medical World, March 15, 1922, ii, 88.*

Ossification of First Costal Cartilage and Apical Tuberculosis.—It was thought that ossification with fissuring of the first costal cart.lage might have some diagnostic and prognostic relation with apical tuberculosis. Nearly 3000 X-ray plates were examined. In 2.65 per cent of soldiers ossification of the first costal cartilage with fissure occurred; the same condition occurred in 16 per cent of men and 3.4 per cent of women in civil life. No diagnostic or prognostic connection between this condition and tuberculosis of the apices could be established.—*Einiges über Gelenkspaltbildung im verknöcherten 1. Rippenknorpel, F. Salomon, Ztschr. f. Tuberk., April, 1922, xxxvi, 99.*

On the Relation Between NaCl Contents of Blood and Tubercle Bacillus in Circulating Blood.—*Junjiro Sakaki (Nippon No Ikai, January, 1922, xii, No. 2). Title only given in Japan Medical World, May 15, 1922, ii, 139.*

Differentiation of Tubercle Bacilli by Agglutination.—To produce an agglutinating serum of considerable titre a nonvirulent strain of living human tubercle bacilli was used. A rabbit was given increasing intravenous doses (from 5 to 30 mgm.) at five day intervals. The titre was found highest at the final dose. To perform the agglutination test, homogeneous emulsions were used, standardized against a constant suspension of barium sulphate. The method was the usual macroscopic one of doubled dilutions of serum. Readings were made one-half hour after removal from the water bath, where the tubes were incubated for two hours at 55° C. By the test it was shown that different strains of tubercle bacilli do not belong to one serological group. Of eleven strains tested, three were agglutinated in 1 to 1600 dilutions, four in 1 to 400 and four were not agglutinated by a 1 to 50 dilution, the lowest used. Of six bovine strains tested, two gave a slight agglutination in the 1 to 50 dilution. For estimating the precipitins in the immune serum, antigens were made from the homologous human and a bovine strain. The method of preparation was that used by Douglas (1921) in working with *B. dysenteriae Shiga.* The human antigen gave positive results in 1 to 120 dilution whereas the bovine precipitated only as high as 1 to 8. Both by the agglutination and by the precipitin test there is evidence of a group reaction with certain strains of bovine tubercle bacilli.—*An Agglutinating Serum for Certain Strains of Tubercle Bacilli, J. Smith, Lancet, July 1, 1922, cciii, 13.*

Inoculation of Rabbit's Testicle as Test for Human Tubercle Bacilli.—The rabbit has the following advantages as an experimental animal in tuberculosis work: 1. The progress and the regression of the disease can be readily observed when inoculation is made into the testicle. 2. Tuberculin reactions show that the testicle is a good organ to employ for experimental work in tuberculosis. 3. The rabbit's testicle reacts to very small quantities of human tubercle bacilli.—*Kaninchen als Versuchstier für den Tuberkelbazillus "typus humanus," R. Arima, Ztschr. f. Tuberk., April, 1922, xxxvi, 114.*

Effects of Suprarenal Insufficiency in Cats.—Previous work has shown that heat production is usually diminished in cats when there is entire suppression of suprarenal function. Suprarenal injury less severe than this causes in the majority of cats a profound effect upon the calorific mechanism, characterized by a significant increase in heat production, as shown by estimations of basal metabolism. To produce the injury, vein ligation was used in some cases but freezing proved to be the most satisfactory method. In addition to the effect on heat production there were correlated clinical symptoms including increased appetite, with or without a gain in weight, sleekness of fur and rapidity of wound healing—nutritional manifestations to be explained on the basis of thyroid function. There were other phenomena, however, which suggest vastly wider interrelationships between the suprarenal gland and the body tissues. In fatal suprarenal insufficiency gastric ulcer was frequently observed. Also symptoms of disturbed gastrointestinal function, usually manifest as diarrhea, were frequently evident; in one case the diarrhea was bloody. Profound asthenia in fatal cases bespeaks a fundamental function of the suprarenal in relation to some part of the nerve-muscle motor mechanism. Further evidence of the importance of the cortex as opposed to the medulla in influencing essential tissue functions is indirectly afforded by these experiments. There are striking points of similarity between suprarenal insufficiency in cats and Graves disease. The most prominent single phenomenon in each is a significant increase in heat production. Each has a phase of asthenia and exhaustion, with evidence of severe cardiac damage. Diarrhea and nutritional and weight changes are common to each. Hyperplasia of the thyroid is produced in each and is characteristic of neither. The thyroid is indispensable for the increased heat production following suprarenal injury in rabbits but not for the asthenia and fatal termination. Finally, that unusual form of Graves disease, running a rapidly fatal course in a very few weeks with severe asthenia, prostration, and coma, bears a striking resemblance to the effect of fatal suprarenal insufficiency when death is postponed for several days. Insufficient injury to the suprarenals in cats produces no significant alteration in heat production.—*Influence of Glands with Internal Secretion on the Respiratory Exchange, IV. Effect of Suprarenal Insufficiency in Cats, W. J. M. Scott, J. Exper. Med., August 1, 1922, xxxvi, 199.*

Hemoptysis.—The following observations have been made on 1926 patients in the sanatorium of St. Blasien from 1916 to 1920 from the standpoint of pulmonary hemorrhage: (*1*) *Sex:* Pulmonary hemorrhage is much more frequent in men than in women, the figures given being 38 per cent and 62 per cent for females or males, respectively. (*2*) *Age:* The greatest number of tuberculous hemoptyses occur between the ages of fifteen and twenty-five years. (*3*) Pulmonary hemorrhage is often brought about by careless exposure of patients to sun baths. (*4*) While artificial sunlight is not so potent a factor in the causation of pulmonary hemorrhage, two such cases are attributed to quartz lamp treatment. (*5*) By the simultaneous use of tuberculin, partial antigens and sun treatment, hemorrhage can be obviated by avoiding excessively strong reactions. (*6*) In the X-ray treatment of pulmonary tuberculosis no hemorrhages are caused in properly chosen cases with accurately adjusted doses. The X-ray accelerates healing by stimulating the production of connective tissue and thus lessens the probabilities of hemorrhage. (*7*) Change of weather rather than the weather itself is a factor in the causation of pulmonary hemorrhage. (*8*) So called vicarious hemorrhages have no practical significance in pulmonary tuberculosis.—*Zur Entstehung der Lungensblutungen, L. Rickmann, Deutsch. med. Wchnschr., March 2, 1922, xlviii, 284.*

Diagnostic Methods in Pulmonary Tuberculosis.—In view of the variable clinical symptoms and forms of pulmonary tuberculosis a satisfactory and exact diagnosis can only be attained by means of suitable differentiation. Pathological anatomic tissue changes result from pathological-biological processes. In both cases the development must be equivalent. Between the anatomic and the biological presentations, if correct, there can be no basic differences. With exact execution of the methods of study like basic results must be obtained. Practically, the differentiation of the pathological anatomic changes in the living by means of roentgen diagnosis should lead to the same results obtained with a suitably performed "biological development" diagnosis. The roentgen method not only determines the pathological anatomic character of pulmonary tuberculosis (Aschoff-Nicol, Gräff-Küpferle), but differentiates the progress and age of the disease according to the Aschoff grouping. The immuno-biological methods have yielded little that is satisfactory. A "biological status diagnosis" cannot be rapidly made but recourse must still be had to the "biological development" diagnosis (v. Hayek). Of great practical significance, therefore, is the agreement in the results from both methods.

This agreement makes it possible, when necessary, to draw correct conclusions from one of them about the healing and disease processes in individual cases. For future tuberculosis study, and also for the practising physician, it is necessary that pathological anatomic and immuno-biological conceptions in the individual case are summarized into unit idea complexes. Roentgen diagnosis is therefore given an especially significant value. From a good roentgen plate much information can be obtained. The entire disease condition in its various stages the pathological anatomic differentiated character of the tuberculous changes, and, above all, the status of the healing processes can be seen. From these can be concluded the appearance of the disease and the biological relation to the patient. In many cases the prognosis and indications for treatment can be determined from the roentgen picture. Yet the roentgen plate in all cases is not definite regarding pathological anatomic conditions in all cases and, therefore, it alone cannot define the case. The clinical picture and the biological behavior combined with the roentgen plate must then be considered.—*Pathologisch-anatomische (röntgenologische) und biologische Differenzierung tuberculöser Lungenerkrankungen, H. v. Hayek and R. Peters, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix, 162.*

Faulty Diagnosis of Patients Admitted to Sanatoria.—The fact that healthy or nontuberculous or inactive tuberculosis cases enter sanatoria has been emphasized by sanatorium physicians themselves. In Lostau, during the past five years, there were admitted 2258 patients, of whom 5.5 per cent were free from tuberculosis on primary admission, while 10.4 per cent were inactive and 9.3 per cent were hopeless cases. Of the repeated admissions 2.1 per cent were free from tuberculosis, 18.9 per cent inactive and 5.4 per cent hopeless. Thus there was no need of treatment in 15.9 per cent of primary admission and 21 per cent of repeated admission cases. The percentage varies in the different sanatoria and, according to the literature, the figures lie between 15 and 20 per cent. The figures given by Büttner-Wobst and Heinecke (60 to 80 per cent) are far too high, and do not apply to sanatorium material, since this survey was made on only the favorable cases. Likewise, this cannot serve as a criticism of the sanatorium physician. The physician who sends the patient to the sanatorium is to blame for the admission of these cases. Three methods of preventing this are recommended: (1) the chief sanatorium physician to pass on the cases himself; (2) preliminary admission examination of the questionable cases in well equipped observation divisions and by a tuberculosis specialist; and, (3) preliminary observations in dispensaries, in which all claims are weighed in the doubtful case. Even then errors in diagnosis will creep in because of the difficulty of determining early pulmonary tuberculosis and differentiating active from inactive tuberculosis, but the errors will at least be reduced to a minimum.—*Über erstmalige und wiederholte Heilstättenkuren, Bochalli, Beitr. z. Klin. d. Tuberk., October 15, 1921, xlix, 114.*

Sedimentation of Red Blood Cells in Diagnosis of Pulmonary Tuberculosis.—The separation of citrated blood into two layers, the lower darker layer consisting of red blood corpuscles and the upper of plasma, has been observed to occur in a number of conditions, such as pregnancy, syphilis, malignant tumor, etc. Hence the reaction is not a specific one. In this work it was found to occur also in cases of active, but not in latent, pulmonary tuberculosis, and can be considered of some diagnostic value of an active process, provided the numerous other causes for the occurrence of the sedimentation can be ruled out. It is especially valuable in prognosis, since an increased rate of sedimentation indicates greater destruction of tissue. The tuberculin reaction does not parallel the above reaction.—*Die Senkung der roten Blutkörperchen im Zitratblut bei Lungentuberkulose, G. Katz, Ztschr. f. Tuberk., March 1922, xxxv, 401.*

Proper Method of Measuring Chest Girth.—There are three levels at which the chest girth is customarily measured: the axillary has been generally discarded, the mammillary is used by most medical men, and the xiphoid is very appealing for further study with reference to avoidance of the pectoral muscle and gland tissue in men and women. A study of two normal series of subjects composed of forty men and 114 private school boys demonstrated certain errors in the measurement of chest girth at rest. The conclusion is that the chest girth should not be measured at rest, except as a necessity in children who do not breathe freely, as occurs not infrequently under six years of age. Measurements are better taken at both full inspiration and complete expiration, and the average used as the midway girth.—*Against Measuring the Chest Girth at Rest, H. Gray, J. Am. M. Ass., July 29, 1922, lxxix, 349.*

Pulmonary Sign in Acute Biliary Tract Infections.—In acute infections of the gall bladder or ducts the patient may com-

plain of pain at the right costal margin, and crepitations may be heard over the right side of the chest or even a pleural friction rub at the right base. This is interpreted as indicating a pulmonary congestion, due to actual metastasis of the infection through lymph or blood channels or to a nervous reflex with hypostatic congestion. Over 50 per cent of the patients showing this sign also complained of acute shoulder pain usually attributed to a phrenic reflex.—*A Pulmonary Sign in Acute Infections of the Biliary Tract, D. P. D. Wilkie, Brit. M. J., June 10, 1922, no. 3206, 908.*

Moro's Diagnostic Tuberculin.—In a comparison test of Moro's diagnostic tuberculin with O.T. on about 180 cases of incipient, moderately advanced and advanced tuberculosis, 56.6 per cent gave a positive cutaneous reaction to O.T. and 63.2 per cent to Moro's tuberculin.—*Über das "diagnostische Tuberkulin" nach Moro, E. Wever, Ztschr. f. Tuberk., April 1922, xxvi, 117.*

Complement Fixation Test in Pulmonary Tuberculosis.—Fifty Brompton Hospital cases, in which the tuberculosis complement fixation test was positive in 1920 or early in 1921, and in the sputum of which tubercle bacilli had never been found, were recently investigated. Eight of these cases were reported as dead and tubercle bacilli had been found in 3 of these. Of the remaining 42 cases, 29 were reëxamined. Thirteen of these 29 (44.8 per cent) were proved definitely tuberculous by the finding of tubercle bacilli in their sputum. Thus, it is definitely shown that the test is positive before tubercle bacilli can be demonstrated in the sputum. The presence of pulmonary symptoms with a positive test must be regarded as an indication of active pulmonary tuberculosis. Postmortem evidence shows that in a certain number of nontuberculous cases old tuberculous foci exist. In these old foci the bacilli, when present, may be entirely shut off from the general circulation and so no complement-fixing substances are formed. The method of performing the test is described in a previous article (*Lancet, 1920, ii, 647*).—*Further Evidence of the Value of the Complement Fixation Test in Pulmonary Tuberculosis, A. L. Punch and A. H. Gosse, Brit. M. J., July 15, 1922, no. 3211, 79.*

Tuberculous Headache.—Experience has demonstrated that, although rarely, fully developed tuberculous meningitis with bacilli in the spinal fluid can heal. Only to a slight extent have clinical studies been concerned with the question whether there may take place basal tuberculous meningitis which, because of few bacilli and perhaps of special immunity relations also, can lead to a mitigated form of the classical tuberculous meningitis. French literature is inclined to favor this view, and some French authors claim to have seen cases of transient tuberculosis with outspoken symptoms of meningitis. A case is described in which a diagnosis of "a mitigated form of tuberculous meningitis" is made. The predominating symptom was a persistent headache. There were also a mildly positive Kernig sign and slight neck rigidity. The patient had positive pulmonary findings and fever, spinal fluid pressure markedly increased, lymphocytes 277, Nonné-Apelt and Pandy tests positive, no bacilli in the spinal fluid sediment, blood and spinal fluid. Wassermann reaction negative. After lumbar puncture there was an exacerbation, followed by a diminution in the headache. Tuberculin hypersensitiveness was marked. The case terminated in a practical cure. Barbier (*Presse Méd., 1914, no. 10*) described a case, confirmed by autopsy, which proved the possibility of a tuberculous meningitis healing. In agreement with Münzer, Riedert, Riebold and Balint, and opposed to Quincke and Oppenheim, it is maintained that tuberculosis is an important etiological factor in *meningitis serosa*, being comparable to *Pleuritis exsudativa tuberculosa*. Meningitis serosa leads to hydrocephalus, while adhesions of the tuberculous granulation tissues inhibit or retard the normal flow of the cerebrospinal fluid. On the basis of the latter condition tuberculous meningitis serosa can develop with normal spinal fluid pressure, while the roentgen picture can reveal hydrocephalic changes. The presence of tubercle bacilli on and in the meninges is not absolutely necessary to produce tuberculous meningitis serosa, since tuberculous toxins can localize in the meninges and cause the same symptoms. The meninges can be affected as a part of a polyserositis. In a case of this type there were statements in the anamnesis which led to the view that a tuberculous rheumatism in the sense of W. Neumann was being dealt with. Neumann maintains with Weintraud that tuberculotoxins after sensitizing the synovial membranes can cause anaphylactic symptoms in the form of a polyarthritis. Three cases are cited in this group of *resorption meningitis* in which the meninges and synovial membranes were coincidently involved. In these cases of *Rheumatismus cerebrale* there existed a markedly increased tuberculin hypersensitiveness. In these casses the intensity of the tuberculous headache was very variable: frequently it is the only symptom which sends the patient to the

physician and again it may not even be mentioned. Outspoken meningeal symptoms, such as a barely measurable contracted pupil, are frequently lacking. The patellar and achillean reflexes are regularly increased and a patellar clonus exists; the reflexes of both sides are not always equally marked, as was also observed by Grober in meningitis serosa. The pressure, cells and protein of the spinal fluid increase. Old cases with healed inflammation have only mild headache and normal spinal fluid, and the spinal fluid pressure is not increased, while adhesions at the foramen Magendi inhibit the flow to the spinal canal; and such old cases show definite roentgenological signs of increased pressure in the skull cavity. In differential diagnosis nasal, aural and eye affections must be considered, besides brain tumors, solitary tubercles and chronic brain abscesses. The differentiation of a *meningitis chronica serosa* due to acute infectious diseases (meningitis, encephalitis epidemica or typhus) may be difficult. If the anamnesis does not aid, a certain differentiation is impossible. Therapeutically, lumbar puncture seems to be beneficial, even though the effect is not always lasting. Good results may be had from strong anergic tuberculin therapy. —*Über tuberkulösen Kopfschmerz, A. Frisch, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix, 203.*

X-ray Studies of Cecal Tuberculosis.—The large incidence of intestinal tuberculosis in patients with pulmonary tuberculosis and the usual difficulty of early diagnosis makes this an important topic. Stierlin of Basel in 1911 was the first to call attention to the roentgen diagnosis of ileocecal tuberculosis. This was followed by the work of Case, Pirie, Brown and Sampson, and Carmen. This study covers in particular 80 cases of tuberculosis examined roentgenologically. With few exceptions the barium enema (Holzknecht's formula) was employed. If the entire colon filled it was assumed that the findings were negative. Where a filling defect was observed the patient was later given an opaque meal consisting of four ounces of barium suspended in a pint of malted milk thickened with cornstarch. The patient then abstained from food and was examined six hours later. Half-hourly observations were made until it was determined whether or not the cecum could be filled. A positive diagnosis was made only when both methods demonstrated incomplete filling. With the enema, pressure with the palpating hand fails to keep the barium in the involved portion of the colon. When it is forced in, as soon as the pressure is removed, it rapidly shoots out, the uninvolved portion remaining filled. In this work no discrepancy was found between results obtained with the enema and with the meal. Of the 80 cases, 12, or 15 per cent, were positive, showing a filling defect in the cecum or ascending colon. In 4000 nontuberculous cases, filling defects were sometimes visualized but there was always a definite reason such as carcinomatous infiltration, adhesions or pressure from a neighboring tumor. In achylia gastrica with associated diarrhea, a hypermotility was noted with absence of cecal filling after a barium meal, but a contrast enema differentiated the condition. The filling defect is the most important sign of cecal tuberculosis. How much of the deformity is due to infiltration and how much is reflex spasm cannot be determined by the roentgenologist. When marked thickening and contraction have taken place there may be obstruction. Gastric hypermotility with seven or eight hour stomach residues is frequent. Ileocecal incompetence occurred in 25 per cent of the cases, and in 70 per cent there was a marked ileal stasis. All positive cases were sensitive in the cecal region, but in none was a definite tumor palpable. The patients felt weak and prostrated after a bowel movement and the odor of the stool was foul and penetrating. There is no true hypermotility of the colon, but rather a rapid passage of its contents due to rigidity of infiltration or spastic contraction. Findings similar to those stated above may occur in cancer and ulcerative colitis. A filling defect in the cecum or ascending colon in a person afflicted with tuberculosis and associated with gastrointestinal symptoms is almost always indicative of tuberculosis of this area.—*The Incidence of Cecal Tuberculosis with Pulmonary Tuberculosis, I. H. Levy and H. H. Haft, Amer. J. M. Sci., July, 1922, clxiv, 115.*

Tuberculous Stenoses of Intestine.—In a child of seven years, seen in August, 1916, the history appeared at first to be that of a megalocolon. Bowel movements were infrequent; but when attempt was made to provoke them, they were not large, as one would expect with megalocolon. The child, who was very emaciated, had previously been treated for tuberculous peritonitis. At times he could take nourishment for a few days, and then suffered a crisis of absolute intolerance for food with vomiting at times of a fecal-like nature. Operation showed a tight stenosis of the narrow part of the ileum, 27 cm. from the ileocecal valve. Because retraction of the colon made ileosigmoidostomy impossible, resection of the ileum and cecum with ileocolostomy was done. The patient died the following night. Post-

mortem examination showed a submucous sclerosis without specific lesions but evidently of tuberculous nature. Another patient, a woman of twenty-seven years, two months after childbirth had attacks of colic which gradually developed into crises of intestinal obstruction. Ten months later she was admitted to the hospital with a greatly distended abdomen and with visible peristalsis. At operation, done under local anesthesia, two tight contractures were found, one near the end of the ileum, the other at its smaller portion. Resections and lateral anastamoses were performed with perfect result. Histological examination of the resected portions showed nodules with caseous centres, clearly tuberculous.—*Retrécissements tuberculeux de l'intestin, Lardennois and Baumgartner, Meeting, Société de Chirurgie, February 8, 1922, reported in Le Prog. Méd., Feburary 25, 1922, no. 8 p. 93.*

Tuberculous Spondylitis.—The clinical reports of 7 cases are given and of the various methods now in use. The author recommends for treatment the corset and roentgen ray exposures.—*On the Statistics and Therapy of Spondylitis Tuberculosa, Tokiwo Ikeda, (Juzenkwai Zasshi, January, 1922, xxvii, no. 1), Abstract from Japan Medical World, April 15, 1922, ii, 120.*

Male Genital and Urogenital Tuberculosis.—In 125 cases of genital and urogenital tuberculosis coming to operation an attempt was made to determine where the tuberculous process originated, that is, the location of the primary focus and whether the process was testipetal or testifugal. It was found that the prostate is involved primarily more often than any other portion of the tract, even in cases of purely genital tuberculosis. It was primarily involved in 28.0 per cent. The epididymis was next in frequency (9.6 per cent) and the seminal vesicles in 2.4 per cent of cases. Owing to the fact that the prostate is at the junction of the genital and the urinary tracts a renal tuberculosis can readily lodge in it and from there pass over into the testicles. Compared with the anatomy of the female, in which the urinary and genital tracts are separated from each other, tuberculous involvement of the analogous organs, the tubes and ovaries, is not nearly so frequent. Thus it occurred that tuberculosis of the kidneys was accompanied by tuberculous epididymitis in 59.9 per cent, and by tuberculous tubes in the female in only 18.3 per cent of cases (provided we consider these organs anatomically analogous). It was evident from these studies that in the male the direction of spread of tuberculosis is usually testipetal, that is, from tuberculous kidneys to tuberculous prostate to tuberculous testicles.—*Uber männliche genital und Urogenitaltuberkulose, P. J. Schultz, Ztschr. f. Tuberk., April, 1922, xxxvi, 81.*

Influenza and Pulmonary Tuberculosis.—An influenza epidemic of explosive type occurred in a sanatorium and affected 50 per cent of the patients. None of the patients with early tuberculosis died, while 13 of those severely ill died, 6 of them pneumothorax cases. Death was due to pneumonia. In cases of advanced tuberculosis the course was always protracted and severe. Prophylactically, mild sweating and moderate portions of alcohol seemed to be of value. Therapeutically, large doses of camphorated oil were best. Withdrawing 700 cc. of air in a pneumothorax case with septic pneumonia had no prolonged benefit. Two types of temperature curves were noted, a sthenic or steep form and an asthenic or protracted form. The first indicates a rapid and favorable terminating influenza form, the second the prolonged severe form.—*Influenza bei Tuberkulösen. Typisches und atypishces Fieber, N. Lunde, Beitr. z. Klin. d. Tuberk., January 14, 1922, xlix, 273.*

Influenza and Tuberculosis at Framingham, Massachusetts.—During the epidemics of 1918–1919, there were probably 1500 to 2000 cases of influenza in Framingham, population approximately 17,000: of these about 1100 were reported to the health authorities. The deaths from influenza between September, 1918, and June, 1919, inclusive, were 118; for 1918 alone the influenza death rate was 464 per 100,000. Sixty-two per cent of the deaths occurred among the native born, and 18 per cent among the Italian born. Since the Italian born make up only 7 per cent of the population, the mortality was higher among them than among the other groups. It was estimated that about 12 per cent of the population at large had influenza. Only 4 per cent of the entire tuberculosis group, active and arrested, had the disease, and only 2 per cent of the arrested cases alone contracted it. There thus appeared to be a relative degree of protection in the tuberculosis group. The incidence of tuberculosis, active and arrested, had been found to be 2.16 per cent for the general population; 0.59 per cent for those of Italian stock, and 4.8 per cent for the Irish. Therefore, as between Irish and Italians the tuberculosis ratio was 8 to 1. This may be contrasted with the influenza ratio (mortality) which was Irish, 1, to Italian, 4. The number of active cases of tuberculosis in the tuberculosis group increased 1 per cent after the influenza epidemic,

but this seemed to have been more than balanced by rearrest of the active process in this group. Framingham's experience is that the influenza epidemic was not "a conspicuous, responsible factor in increasing the prevalence of active tuberculosis."—*Framingham Monograph No. 9, Medical Series, IV. Influenza: Framingham Epidemic and Post-Epidemic Observations, July, 1922.*

Syphilis of Lung.—Autopsy reports indicate that syphilis of the lung is rare. Some roentgen ray studies have revealed a much larger incidence, but it is unsafe to diagnose this condition from chest pictures alone. Balzer has recently reported cases of syphilitic bronchitis with demonstration of spirochetes in the sputum; the proneness of the disease to attack the mucous membranes of the mouth, naspoharynx and larynx makes this assumption plausible. Karschner found pulmonary syphilis more common in males than in females and the average time of its appearance after the initial lesion was eleven years. Excluding the congenital white pneumonia, the commoner anatomic lesions are the gumma and the fibroid indurative processes. Secondarily, syphilitic bronchiectasis is not infrequently found; ulcerative and gangrenous lesions more rarely. Gummata are found usually about the hilum and in the lower lobes; they vary in size and number and may erode bronchi, producing cavities. More common are the indurative processes extending from the hilum along the bronchi and blood vessels. Consolidations and catarrh may extend from hilum to apex. Symptoms may include cough, hemoptysis, dyspnea, night sweats, loss of weight and moderate fever; complicating mediastinitis may cause pressure symptoms. The physical signs are those of consolidation, fibrosis, bronchitis or bronchiectasis. With the symptoms and physical signs of tuberculosis, with repeated sputum examinations persistently negative for tubercle bacilli, and with a positive Wassermann reaction, the diagnosis may at least be suspected. X-ray examination may help considerably. If, under intensive antisyphilitic treatment, marked improvment in the general condition and decided clearing of the chest shadows should occur, the diagnosis may be considered established. Syphilis and tuberculosis may coexist in the same lung. Certain cases of pulmonary syphilis do not respond to treatment and some clear without any treatment. In a series of 791 cases admitted to the Cincinnati Tuberculosis Sanatorium in 1920–1921, a diagnosis of pulmonary syphilis was made in four (0.5 per cent); three were in white males and one in a white female, who also had tuberculosis and who died later. The three men recovered, two under intensive antisyphilitic treatment, the third without such treatment. Two other cases from the Cincinnati General Hospital are reported. Summaries of the six case histories are appended and reproductions of the chest pictures showing changes after varying periods of time are included. There is no record of autopsies in the two cases where death occurred.—*Syphilis of the Lung, A. Friedlander and R. J. Erickson, J. Am. M. Ass., July 22, 1922, lxxix, 291.*

Chronic Malaria Complicated by Addisonism.—This patient suffered from malaria with a large spleen since 1917, two months after his return from the Dardanelles, and later developed an Addisonian syndrome with asthenia, hypotension, melanodermia and pigmentation of the mucous membranes, blindness of the right eye from papillary atrophy and polyneuritis of the lower and left upper extremities, manifesting itself by atrophy of the left arm and shoulder muscles. Radiological exploration by the Carelli method showed atrophy of the left adrenal. Attention is directed to the delayed onset of the malarial symptoms, which appeared in spite of prophylactic cinchonization, and to the retrogression of the Addisonian syndrome with diminution of the mucous and cutaneous pigmentation. The importance of the papillary atrophy together with the other polyneuritic disturbances is emphasized; it is incurable and constitutes a grave complication.—*Paludisme chronique compliqué d'Addisonisme, d'atrophie papillaire unilatérale et de polynéurite périphérique, A. Chauffard, J. Huber and R. Clement, meeting, Société Médicale des Hopitaux, January 20, 1922, reported in Le Prog. Méd., January 28, 1922, no. 4, p. 47.*

Bronchial Obstruction from Hodgkin's Disease.—In this case, following the administration of morphine, gr. $\frac{1}{4}$, atropine, gr. $\frac{1}{100}$, and alypin the bronchoscope was passed down the left bronchus one inch below the carina where there was constriction and congestion. Manipulation about the constriction produced intense coughing which a second dose of morphine did not control. Subsequently, X-ray and physical examination and histological study of an excised lymph node warranted a diagnosis of probable Hodgkin's disease.—*Hodgkin's Disease in Which Endoscopy Led to Diagnosis, L. M. Hurd, N. York M. J. and Med. Rec., June 21, 1922. cxv, 746.*

Erythema Nodosum and Tuberculosis.—A discussion of some of the literature

on the nature of erythema nodosum and its possible tuberculous etiology is presented and the results of a study of 45 cases are included. Of these, 42 were females and 3 were males. Fever occurred in all the cases. Several gave a history of rheumatic attacks and in two the erythema nodosum has recurred. There was no evidence of contagion. Of the 45 cases, three, or 6.6 per cent, were tuberculous at the time of eruption, another 3 developed tuberculosis subsequently and 6 were tuberculosis suspects. Of 350 patients with pleurisy, 18, or 5.1 per cent, had previously suffered from erythema nodosum, while, of 1,317 patients with other forms of tuberculosis such as pulmonary, miliary, or surgical tuberculosis or tuberculous meningitis, 12, or 0.9 per cent, gave a similar history. The incidence of the combined groups was 1.8 per cent. When erythema nodosum and pleurisy occurred in the same person, the former usually appeared first and at an average interval of three and a half months before the latter. There was less uniformity in the interval between the outbreak of erythema nodosum and tuberculous manifestations other than pleurisy. In two cases the erythema appeared two days and three weeks, respectively, before the outbreak of the tuberculous lesion, and in three cases of tuberculous meningitis, the interval between the two was six weeks, six and eight months, respectively. In three cases the sequence was erythema nodosum, pleurisy, definite tuberculosis. Diagnostic tuberculin was not employed in the cases studied. In five cases of erythema nodosum material taken from the nodes was inoculated into guinea pigs with negative results. There is little doubt that some relationship exists between tuberculosis and erythema nodosum but just how common and intimate this relationship is has not yet been determined.—*Erythema Nodosum and Tuberculosis, H. J. Vetlesen, Tubercle, July, 1922, iii, 433.*

Disseminated Gummatous Sporotrichosis.—Many of the forms of fungi occasionally pathogenic for men are, in their natural state, saprophytes on dead vegetables, bark of trees, hay, etc. The sporotrichum occupies an important place in this group, its pathogenicity having been first demonstrated by B. F. Schenck of Johns Hopkins (1898). The sporothrix has been found in every tissue of the body, the common type in this country being the localized lesion. Following an injury a nodule appears, often on the tip of the finger, which ulcerates and discharges pus. Extension is by the lymphatics, so that a chain of several separate nodules may be seen along the arm or leg. The course is slow, and spontaneous healing is not the rule. The regional lymphatics often, but not always, become enlarged and tender. A case in a young negro is reported. The disease began as a painful swelling on the top of the right foot. Nodules appeared on the left foot, upper arms, cheek bones and forehead. Moist râles were present at the bases of both lungs, more numerous on the left. This side also showed slightly limited respiratory excursion with percussion note and breath sounds not as distinct as on the right. There was irregular fever as high as 103° F. thoughout the illness. Cultures of aspirated pus showed the presence of sporothrix. The roentgen ray plate showed a slightly hazy left apex and a somewhat circular shadow extending from the right hilum, about 6 cm. in diameter, with radiating fine linear markings. Treatment consisted of large doses of potassium iodide and arsphenamine. In spite of this the disease progressed and death occurred two months after admission to the hospital. Autopsy showed a small nodule in the upper lobe of the right lung having the characteristics of those found in the skin. Sections from the lungs and skin nodules showed a connective tissue stroma infiltrated with leucocytes, round cells and many giant cells much like those found in tuberculosis. It was often found quite impossible, in certain areas, to differentiate these lesions from tuberculosis. Intravenous inoculation of cultures in rabbits, guinea pigs and albino rats produced nodules in the viscera and brain. Only in the albino rats were lung lesions produced. Attention is called to sporotrichosis as a generalized disease and to the probability of cases of lung sporotrichosis which are unrecognized.—*Report of a Case of Disseminated Gummatous Sporotrichosis, with Lung Metastasis, L. M. Warfield, Amer. J. M. Sci., July 1922, clxiv, 72.*

Defects in Present Mode of Treatment of Tuberculosis.—Most sanatoria were originally planned and built to care for the early case of tuberculosis but experience has shown both in public and private institutions that the bulk of the patients received are well past the first stage of the disease. Gradually it was realized that the results were not as brilliant as anticipated but our vision was not clear enough to see that, for the treatment of the cases *actually sent* to sanatoria, these institutions were more or less unfitted. There are several reasons why such conditions exist. Factors in human nature cause the patient to go on with his usual activities because he may not appreciate the first vague symptoms of tuberculosis and he is not prone to heed such slight manifestations even though warned of their

danger. Added to this in many cases are economic factors. The patient may not feel able to relinquish his work and the actively sympathetic employer is rare. "Contacts" may be examined and sent to sanatoria but they will not stay long enough for the cure to be completed. Many patients wilfully conceal the facts of their disease; this is shown by the observation that 25 to 55 per cent of the cases of pulmonary tuberculosis in England remain unnotified to the local authority. It is not because of ignorance that the cases notified are for the most part those from the lower walks of life. In England a lack of coöperation between the general practitioner and the state paid official interferes with the proper administration of public tuberculosis regulations. The practitioner fails to make use of the services of the tuberculosis officer and patients therefore are frequently not properly treated. On the other hand, the tuberculosis officer assumes the official attitude and often is hampered in the discharge of his duties by lay committees. There is need for a reorganization of the present system of dual control. The lay mind is ever on the alert for a "cure" for tuberculosis. Unfortunately this ever present expectation blinds mankind to methods of prevention. The popular part is undoubtedly that of the cure monger; but, in dealing with tuberculosis, the more practical part is that of the man who, while recognizing the damage done by the disease, is skilled enough to estimate for his patient how his work may be so regulated as to prevent further mischief, to promote repair, and gradually to restore the foundation of health. If treatment involved only the early "suitable" cases, the problem would be easy; and the sanatorium, with its adjunct the dispensary, should meet all requirements, but the advanced case is an uglier reality that we are compelled to face. We recognize the universality of infection but the small fibrosed nodule is a different thing from the clinically diseased lung; and nature's capacity to heal when the process of disease has just begun must be very different from her ability to do it when the disease has passed a certain stage. It is the advanced case for which little or no effort is made to provide permanently suitable conditions. Too often deep-seated lesions, shown only by the X-ray, are not recognized and it is not realized that some early lesions cause the patient to fail more rapidly than advanced disease. We rely too much on formal classification which is not a safe guide for treatment or prognosis and which has led us away from the right method of dealing with cases as they are, not as they seem to be. The general public recognizes quite clearly the failure to "cure" when, after a few months at home, the patient's disease relapses. At the Papworth Colony careful observation showed that cases sent from sanatoria as "arrested" were actually not arrested and this must mean that under sanatorium conditions arrest is not attained. What is attained is a retardation of the progress of the disease in varying degrees; a certain amount of fibrosis is established; but in the majority of cases, on careful search, an active focus is usually found, and when the patient for some reason or other has to return to unfavorable conditions, this active focus breaks out again. Such is the so called "failure of sanatorium treatment." So long as the patient continues to follow the prescribed mode of life the onward march of the morbid processes is imperceptible, but as soon as this mode of life is relinquished the disease reasserts itself and the march is renewed. In the majority of cases past the early stage, the hard manual work undertaken, even in some sanatoria, is detrimental. Frequently the apparently arrested case is discharged from the sanatorium before the effect of this work is observed, but it becomes evident enough when the patient is admitted to a colony where it may be weeks or months before the patient can be transferred to the workshops; and then only for carefully graduated effort. The prescription of hard manual work is too often excessive and rarely beneficial. The method is based on the fallacy that manual work can or may "cure" the disease, whereas it does nothing of the kind. We have to find out under what conditions a damaged organ may "carry on" effectually, and just how much and what kind of work can be performed by the organism as a whole without recrudescence of the disease. If the problem were attacked from this angle, we should not be called upon to give factitious explanations of the imperfection and want of success of our present methods of treatment.—*Further Experiences in Colony Treatment and After-Care, C. Allbutt and P. C. Varrier-Jones, Lancet, July 8, 1922, cciii, 105.*

Climate and Tuberculosis Treatment.—The time is not in the remote past when the climatic treatment of tuberculosis occupied a preponderant part among the measures for combating the disease. At first enthusiasm was directed toward Egypt and Madeira; the benefits of the former were referred to by the younger Pliny; but lately attention has been directed to places nearer at hand, in order to avoid long and costly journeys. Beneficial effects have been noted in marshy, mountainous and marine localities, while others have claimed an antituberculous influence for high altitudes, quoting statistics

to show that tuberculosis decreases as altitude increases. It is claimed that the tubercle bacillus loses its virulence more rapidly in a highly radiant atmosphere under diminished pressure, and that the lungs function better under such conditions. The benefits of maritime climates have been ascribed to their great luminosity, the sea absorbing the caloric rays but reflecting the luminous and chemically active rays, which are of great biological importance, actinic power being at its maximum on the sea. The greater part of the medical profession is little impressed by all this reasoning, having a profound conviction that the tuberculous can be cared for and cured anywhere, no matter what the climatic conditions. This scepticism is comprehensible but not always excusable. The choice of a location for a sanatorium has sometimes been made without taking into account climatic advantages. The physician who is called to give advice on the value of a place for a tuberculosis sanatorium or preventorium should have some elementary ideas of climatology, including the various meteorological factors which enter into a given climate and their variations in particular localities. Neighboring valleys may have quite a different climate. Atmospheric pressure, temperature, humidity, precipitation, luminosity and purity of air should all be studied. Transitory atmospheric disturbances produce in the sensitive tuberculous a feeling of oppression and malaise which reacts on the entire body. Abrupt variations of temperature effect the body more than extreme temperature. Cold dry winds are to be dreaded, but excessive humidity is dangerous whether the weather be hot or cold; in the latter case because the body loses heat and in the former because of insufficient evaporation, which tends to cause pulmonary congestion and may favor hemoptysis. The action of light on the tuberculous has been neglected. From the pyschic side fine weather is beneficial. On the other hand, rain increases the purity of the atmosphere. Finally, the absence of excessive variations in any meteorological factor is to be desired. It is the duty of the physician to recognize and appreciate these facts and to know how to apply them practically.—*La lutte antituberculeuse et la climatologie, G. Ichok, Le Prog. Méd., January 6, 1922, no. i, p. 4.*

Artificial Pneumothorax Treatment.—The cases reviewed were treated with artificial pneumothorax in the Waldhof-Elgershausen Sanatorium since 1915. Many of the accidents are attributed to the fact that it is continued injudiciously outside of the hospital or sanatorium. Exudates occurred in 35.6 per cent of the cases. An unfavorable or favorable influence of the exudate upon the tuberculosis was not noted. The results of the pneumothorax treatment were 35.6 per cent dead, 10.9 per cent doing poorly and 39.7 per cent favorably. In 16 cases (of a total of 29) it has been discontinued and in 13 is still being maintained. It is believed that the results would have been far more favorable had the cases remained under observation longer.—*Kritischer Bericht über 104 Pneumothoraxfälle, H. Liebe, Beitr. z. Klin. d. Tuberk., November 12, 1921, xlix, 125.*

Freedom of Pleural Cavity in Artificial Pneumothorax.—An attempt to determine, before artificial pneumothorax, whether the pleural space has been encroached upon and whether complete or partial collapse of the lung in any particular case is possible, was made by physical, roentgenological and postmortem examinations and electrical excitation of the phrenic nerve. Roentgen examination alone was not sufficient to determine this point. The respiratory expansion of the lung must be determined by both the X-ray and physical examination. Excitation of the phrenic nerve in the cervical region and simultaneous observation of the movements of the diaphragm enable one not only to note the mobility but also the location of adhesions, whether above or below the diaphragm. One can then be reasonably certain of the freedom of the pleural space when the physical, X-ray and the electrical examinations show an adequate lung excursion.—*Über die Bestimmung der Freiheit des Pleuralspaltes mit Berücksichtigung des künstlichen Pneumothorax, E. Schill, L. Kenéz, and G. Szegvári, Ztschr. f. Tuberk., April, 1922, xxxvi, 104.*

Pleuropulmonary Fistulae in Course of Artificial Pneumothorax.—Pleuropulmonary fistulae are frequent in the course of artificial pneumothorax and play an important rôle in the causation of pleural effusions. In almost all cases of exudate occurring with artificial pneumothorax, the presence of fistula could be demonstrated, although not all effusions were due to such perforations alone. At the same time, lung perforation in the course of artificial pneumothorax does not necessarily lead to effusion any more than it does with spontaneous pneumothorax. This view of the frequency of pleuropulmonary fistulae has been constantly disputed because the perforations go unrecognized, since observers do not suspect the condition and do not employ proper methods to detect it. Clinicians are too often obsessed with the quite erroneous idea

that spontaneous pneumothorax is always a matter of severe symptoms and serious outcome. When due to rupture of healthy tissue, it is ordinarily not of grave import and heals rapidly. Nevertheless, these mild forms are the exception in spontaneous pneumothorax, since perforation often occurs through an ulcerated surface lesion and not by the rupture of emphysema vesicles or the tearing of adhesions in healthy tissues. The latter conditions, on the other hand, apply to ruptures occurring with artificial pneumothorax. Most perforations in the course of artificial pneumothorax are valvular in action. Positive intrapleural pressure serves to close the fistula, and the amount of new airallowed to enter thepleural cavity is no greater than that which is absorbed. Thus, there is a relatively fixed equilibrium of gas components, the entry of new air being too slow and gradual to upset it. This equilibrium is disturbed only when the gas or air is artificially expelled and the penetration of new air is thus induced and accelerated. Intrapleural pressure is the most important factor in the diagnosis. Where a pleuropulmonary fistula is suspected one applies the method long ago recommended by Béclère for finding the pressure in spontaneous pneumothorax. An exploratory needle is introduced into the pleural cavity and the pressure determined. The needle is connected by rubber tubing with a simple glass tube, the tip of which is dipped in a glass of water. The patient is now made to cough, in order to expel air from the pleural cavity, and the bubbling through the water indicates that air is actually being forced out. Intrapleural pressure is now quickly taken again and is generally found to have fallen a few centimetres. Next, the patient is allowed to breathe freely and quietly, whereupon the pressure rapidly regains its original figure, even in one or two minutes. The manometer tube should be of small diameter, since pressure variations are of short duration and oscillations should be as plain as possible. The author has seen no ill effects from having patients cough under these circumstances, but is cautious in not requiring any more cough than is necessary.—*Du diagnostic et de la fréquence des fistules pleuro-pulmonaires qui surviennent au cours du pneumothorax artificiel, L. Bard, Ann. de Méd., January, 1922, xi, 1.*

Treatment of Tuberculosis with Chaulmoogra, Codliver and Other Oils.—In the treatment of leprosy there have been certain objections to the use of chaulmoogra oil, but in 1915 the author prepared some sodium gynocardate which was quite soluble and slowly effective by subcutaneous and intramuscular injections and, intravenously, produced febrile reactions with softening and gradual absorption of leprous tubercles and disintegration of the lepra bacilli. In some cases improvement continued for many months after treatment was stopped. This suggested the use of the agent to treat tuberculosis but, should softening result, there would be the risk of disseminating the disease. Sodium morrhuate was therefore made from the fatty acids of codliver oil; this was found to be readily soluble, little irritant to the tissues, and about equally effective as the chaulmoogra oil preparation intravenously and rather more so subcutaneously, because of its easier absorption, while it was of value in leprosy as an alternative to the former preparations. It was thought on this account that the unsaturated fatty acids as a class might possess therapeutic properties, and this was confirmed by obtaining another soluble and active sodium salt of the fatty acids of soy bean oil, selected for its high content of fatty acids. Davies has also reported favorable results in both leprosy and tubercle with sodium linate made from linseed oil; Muir has confirmed this as regards leprosy and has prepared another active soap from olive oil. The effect of this potent class of substances may be a chemical reaction with the fatty acids known to be present in the coating of acid-fast bacilli, so weakening their protective envelope as to allow the human tissues to break them up, thus setting free immunizing antigens. The soluble soaps of chaulmoogra oil are one hundred times as lethal as pure phenol in fluid media on long exposures against acid-fast bacilli as a group, although inactive against other groups of bacteria, suggesting a direct action of the lepra bacillus. This, however, will not explain the activity of sodium morrhuate, solutions of which make a good culture medium for tubercle bacilli. Muir has also recently found that vaccines of acid-fast bacilli may assist the action of the soaps in leprosy, which is of interest in relation to the action of tuberculin, which can produce violent reactions in leprosy. Evidence of the effect of the substances in experimental tuberculosis is variable, but tends to be favorable where the infecting dose of bacilii is not large. Wallis has recently obtained a typical tuberculosis complement fixation reaction in a case of leprosy, which shows the close biochemical relationship between the two causative bacteria. Some observers have obtained good effects with sodium morrhuate in pulmonary tuberculosis, even in advanced stages, but others did not note any improvement from short trials of the treatment. During the last few months Cummins has tried ethyl ester hydnocarpate, prepared from hydnocarpus oil. which contains more of the

active hydnocarpic acid and less of the comparatively inactive chaulmoogric acid than chaulmoogra oil; he obtained severe reactions with 0.1 cc. in a few tuberculous patients and thinks it may cause an increase in physical signs. Sharpe has used a mixture consisting of ethyl ester hydnocarpate, 1 cc., camphor, 1 gm., creosote (double distilled), 1 cc., and olive oil, 2.5 cc., in doses beginning with 0.25 cc. and increasing by the same amount at each dose up to 4 cc., intramuscularly, in chronic forms of tuberculosis selected as being in a stationary condition after some time under observation. Following injection there was a short temperature rise of one or two degrees, sometimes with a temporary increase in sputum, but no harm was done and several became afebrile, gained weight and became able to exercise. A similar mixture without the creosote is now being tried. Intramuscular injections of ethyl esters prepared from chaulmoogra and hydnocarpus oils are perhaps more promising than morrhuate preparations, although ethyl ester morrhuate, intramuscularly, may prove better than sodium morrhuate, intravenously, in phthisis; the more chronic forms of disease seem more suitable for treatment. Sodium morrhuate has had good effects in surgical forms of tuberculosis and should be tried further. The reactions in tuberculous lymph nodes and slight transient hemoptyses in phthisis, following subcutaneous or intravenous injections, proves that the substance exerts a specific action on tuberculous lesions as well as on those of leprosy. The writer asks for reports on the use of sodium morrhuate or gynocardate in tuberculosis and offers to give further information to any who may desire to try the treatment.—*The Application to Tuberculosis of the Successful Treatment of Leprosy by Soluble Preparations of Chaulmoogra, Cod-Liver, and Other Oils, L. Rogers, Brit. J. Tuberc., July, 1922, xvi, 110.*

Chaulmoogra Oil in Tuberculous Laryngitis.—Seven patients in the Colfax School for the Tuberculous were set aside for treatment with chaulmoogra oil. All had severe laryngeal lesions, with excrutiating pain and dysphagia in all but one case; likewise, all but one were febrile, with far advanced pulmonary tuberculosis. Treatment was given three times weekly, beginning with a 10 per cent solution of chaulmoogra oil in olive oil, increased after the first week to 20 per cent. In one case the relief from dysphagia was remarkable; in the others subjective symptoms were not markedly altered. The general condition of all but two patients grew steadily worse. *Conclusions*: Intralaryngeal applications of a 10 to 20 per cent solution of chaulmoogra oil in olive oil may relieve the dysphagia of an advanced laryngitis case entirely, but such relief has followed its use in only one out of the seven cases reported. Slight temporary relief occurred in every case. 2. On the other hand, the general condition of a febrile patient may possibly be unfavorably influenced by such treatment. 3. Caution should be used in the laryngeal treatment of tuberculosis with chaulmoogra oil until more accurate data are in our possession concerning its local and general effects.—*The Chaulmoogra Oil Treatment of Tuberculous Laryngitis, R. A. Peers and S. J, Shipman, J. Am. M. Ass., August 5, 1922, lxxix, 461.*

Chaulmoogra Oil in Tuberculous Laryngitis.—This treatment was introduced in the throat clinic of the U. S Veterans' Hospital, Maywood, Illinois, following the publication of Luken's paper, and during the last four months 40 cases of tuberculous laryngitis have been treated, with daily applications of a 20 per cent solution of chaulmoogra oil in liquid petrolatum. The patients are divided into the following groups: Group 1, with distinct but not extreme laryngeal lesions; in these the symptoms were controlled by the intralaryngeal injections, dysphagia often being relieved by a few treatments. Occasionally the anodyne effects of orthoform has to be used as an adjunct. Group 2, cases of early tuberculosis with very slight laryngeal symptoms or signs; these cases often cleared up after a few treatments. Group 3, advanced tuberculosis with advanced laryngeal lesions, previously treated with no benefit; some results were noted. Group 4, chronic laryngitis dependent on nasal conditions; no particular benefit. *Conclusions:* Chaulmoogra oil should it is believed, have a definite place in the treatment of laryngeal tuberculosis. It is useful in the majority of cases, although it cannot entirely replace other forms of medication. It may be true that the oil has no specific effect, but its beneficial action can be perhaps adequately explained by its detergent, anesthetic and counterirritant properties.—*Chaulmoogra Oil in the Treatment of Tuberculous Laryngitus, F. L. Alloway and J. E. Lebensohn, J. Am. M. Ass., August 5, 1922, lxxix, 462.*

Chaulmoogra Oil Derivatives in Leprosy.—Chaulmoogra oil has long been recognized as the best remedy in the treatment of leprosy. Old Buddhist records in India of ten or more centuries ago refer to the improvement in infected persons after eating the raw chaulmoogra seeds. In modern times its use has been revived, at first by

mouth, which was unsatisfactory because of the gastric disturbances and the length of time required, and later in mixtures suitable for hypodermic injection. In 1916 Rogers reported the preparation of soluble salts of fractions of the fatty acids of the oil and their use, intramuscularly and intravenously. He made three preparations of the chaulmoogric acids, containing fractions of the lower, medium and higher melting points, which he arbitrarily called sodium gynocardate, hydnocarpate, and chaulmoograte. The latter salts were quite insoluble unless combined with other substances; the hydnocarpate was found to be more active than the gynocardate and could also be prepared more readily from hydnocarpus oil. Rogers also tested the action of other oils with a large content of unsaturated fatty acids, and found a codliver oil preparation, called sodium morrhuate, most effective. The ethyl and other esters of chaulmoogric acids were first prepared by Power and his collaborators in 1904. In 1919 Taub, of Elberfeld, Germany, obtained patient rights for their preparation and use as *Antileprol*. Following the war, the alien property custodian sold the rights of this patent in the United States to the Winthrop Chemical Company of New York, which distributes the ethyl esters under the trade name *Chaulmestrol*. Meanwhile, in 1919 Hollman and Dean reported the preparation and use in Hawaii of the ethyl esters of the fractions of the fatty acids. It was decided that the therapeutic agent in chaulmoogra oil was distributed through four fractions. Recently, McDonald has reported the paroling of 150 cases of leprosy after treatment with the mixed ethyl esters combined with iodine, which latter ingredient, however, has been shown to be unnecessary. The investigations of Walker and Sweeney show that chaulmoogra oil contains substances having high bactericidal activity *in vitro*, which is specific against the acid-fast bacteria, and was found to reside in the fatty acids of the chaulmoogric series, and to be a peculiar function of their peculiar carbon ring structure. Other unsaturated fatty acids were not found to possess this activity. The therapeutic results obtained at the San Francisco Hospital were rather discouraging and at variance with expectations. None of the 21 patients became bacteriologically negative, and only a few showed significant benefit, in spite of months of treatment. However, most of them were far advanced longstanding cases. Meanwhile further laboratory investigations disclosed that two other esters, the butyl and propyl, produced much less reaction and pain than the ethyl, and were equally effective. Recently, a visit was made to Hawaii to observe the antileprosy work there. It was found that 8 per cent of patients paroled from Kalihi between 1918 and 1921 have returned with recurrences and at least 4 per cent have died. Recently, greater caution has been used in paroling and discharging patients. There are also present at Kalihi many patients with advanced and incurable disease who should probably be sent to Môlohai. No patients have gone there since 1919. Finally, it seems probable that the present system of treatment will cure the early cases, especially when young, and that many advanced cases will improve in time, and possibly some be cured after years of treatment. The opinion is advanced that the injections must be kept up for at least three years in the milder cases and much longer in the advanced ones.—*Experience with Chaulmoogra Oil Derivatives in Treatment of Leprosy, H. Morrow, E. L. Walker and H. E. Miller, J. Am. M. Ass., August 5, 1922, lxxix, 434.*

Intravenous Injections of Calcium Chloride for Vomiting and Gagging in Tuberculosis.—Vomiting and gagging cough in the tuberculous yielded to intravenous injections of 50 per cent calcium chloride after the method of Rist and Ameuille. Excellent results are to be obtained by a single injection of 1 cc. repeated if necessary. This therapeutic measure deserves a place in current practice.—*Injections intraveineuses de chlorure de calcium, Merklen and Dubois-Roquebert, Meeting, Société Médicale de Hôpitaux, February 24, 1922, reported in Le Prog. Méd., March 4, 1922, no. 9, p. 107.*

Irrigation of Tuberculous Lung Cavity.—Six cases are reported, including a variety of suppurative lung lesions treated locally by use of the bronchoscope. One patient had had tuberculosis with cavity formation for several years. The patient was aspirated and washed on two occasions, the last time being at his request in 1916. This patient died of a cellulitis of the neck a few days after the second bronchosocopy, which was done under local anesthesia and which may have been largely responsible for the death, as there was a great deal of coughing in spite of the fact that morphine sulphate gr. $\frac{1}{4}$, and atropine gr. $\frac{1}{150}$, were given. For this reason some of the earlier cases were given a general anesthetic. It was found that if the morphine is given early enough the cough is kept under fairly good control.—*Treatment of Suppurative Conditions of the Lung, T. E. Carmody, N. York M. J. and Med. Rec., June 21, 1922, cxv, 742.*

Treatment of Tuberculous Cervical Adenitis.—The anatomy of the lymph nodes of the neck is briefly reviewed. About 5 per cent of all tonsils will show, on microscopic examination, areas of tuberculosis, the pharyngeal tonsil being more frequently involved (10 per cent of 1,671 necropsis). Most cases of advanced phthisis show secondary infection of the tonsils. In children the bovine type of organism has been found most often. Van Zwaluwenburg and Grabfield, from X-ray studies, concluded that tubercle bacilli in the tonsil reach the apex of the lung by a direct line of communication through the cervical nodes but clinical evidence does not bear this out. Only a small percentage of patients with pulmonary tuberculosis have previously had lumps in the neck and not many patients with cervical adenitis subsequently develop pulmonary lesions. Of the methods of treatment the first and most natural therapeutic agent is the sun; for applying artificial sunlight the mercury vapor quartz lamp and the carbon arc lamp are used. The latter furnishes an easy method of applying intensive light and is apparently to be preferred to the mercury lamp. The value of the roentgen ray is generally acknowledged and it has been used in conjunction with radium. Opponents of tuberculin are numerous, but its supporters are likewise too numerous to warrant one's saying that there is never any justification for its use. Advocates of radical surgery are decreasing in number, though no one will say that it has not its place. A nonpulmonary tuberculosis clinic has been conducted at the Massachusetts General Hospital for twelve years and during this time there have been seen 600 cervical gland cases, 175 genitourinary, 35 cases of tuberculous eyes and the rest miscellaneous forms of surgical tuberculosis. It is customary, when a patient with cervical adenitis applies for treatment, to give him a thorough general examination, and a section of a lymph node may be excised for diagnosis, although this is not favored as a routine practice. He is seen by the internist and surgeon in consultation and home conditions are investigated by the social service department. In the majority of cases, the tonsils and adenoids are removed. Light and radiotherapy may be considered in consultation with the roentgenologist and dermatologist. Surgery is not usually advised except for the acute, red, tender abscess; chronic solitary cold abscesses, when a node or group of nodes have liquefied, usually heal following simple drainage. Attempts to dissect out the wall of such an abscess are difficult and not necessary. Occasionally, a hard, discrete group of nodes may be removed with ease. Tuberculin is used almost as a routine and after a few weeks' trial the advisability of other treatment is considered; radical surgery is deferred as long as possible. The number of patients totaled 498; most of these were between 20 and 30 years old, the next group being from 10 to 20, and the third, those under 10. Only 150 could be traced. Fifteen had pulmonary infection but only one developed phthisis after leaving the clinic. Thirty-four had affected nodes on both sides, the majority being limited about equally to the right or left; 9 had submaxillary tuberculous adenitis. More than half had demonstrably affected tonsils and adenoids which were removed; now many more, if not all, would have been operated on. Half the patients had secondarily infected acute abscesses requiring incision; in this type tuberculin is beneficial and with longstanding sinuses the mercury vapor quartz lamp is a valuable adjunct to other therapy. Experience with the roentgen ray was limited, but success was not striking in a fair number of cases; these were severe cases of long duration and roentgenotherapy made no marked change for the better in the average patient. Of the 150 patients traced, 15 still have persistent adenitis; none of these followed out the treatment as prescribed. Seven died and only one developed phthisis after coming to the clinic. Of the total 150 cases, 127 are classed as cured with excellent results, 15 as failures due to ceasing treatment, and 8 as failures to respond to conscientiously applied therapy. In 109 of the cured patients the chief therapeutic agent, besides hygiene and possibly incision of secondary abscesses, was tuberculin; in 29 it was the chief element in the cure and in the others it was a very great help. Three tuberculous eye infections were cured with tuberculin. Where tuberculin was ineffective, operation, light or the roentgen ray achieved the desired result in some cases. Tuberculin (B. F.) was used, the initial dose being 0.0001 mgm. It is given once a week and the dose increased gradually, being reduced slightly in case of too much reaction; some patients receive as much as 100 mgm., or more, a week. When other methods fail or when there is some special indication at the outset, radical operation is resorted to. *Conclusions:* There is no certain therapeutic agent, no absolute specific, and no set rule for treating tuberculous cervical adenitis. To lay down a definite scheme, and treat every case thereby is not productive of the best results. Each patient must be carefully studied and considered as an individual and then by the judicious application of our five chief methods, hygiene, light, radiation, surgery and tuberculin, either singly or in combination (for each has

its place), we will find that we approach, as nearly as possible in this stubborn and difficult condition our therapeutic goal.—*The Treatment of Tuberculous Cervical Adenitis, R. H. Miller, J. Am. M. Ass., July 29, 1922, lxxix, 350.*

Prolonged Treatment in Surgical Tuberculosis.—It is emphasized that bone and joint tuberculosis is a disease of long duration with liability to relapse and complications. To avoid such misfortunes the patient should be treated and kept under observation throughout the active period of his disease and for a reasonable length of time after quiescence or healing is established. He may receive educational training during his period of treatment. The facilities for dealing with these cases in the corporation of Bradford (England) are described.—*Continuous Treatment in Surgical Tuberculosis, F. W. Goyder, Brit. M. J., June 10, 1922, no. 3206, 914.*

Bone Grafting in Tuberculosis of Spine.—In Pott's disease all efforts must be directed toward raising the patient's resisting and recuperative powers and at the same time to procure as absolute fixation as possible of the diseased parts and their surroundings. The difficulty of fixing the spinal column by external splinting has led to the development of the operation of bone grafting, whereby absolute fixation of the afflicted part of the column can be obtained. The indications and contraindications are discussed. The author's operation differs from that of Albee's in that two grafts are cut from the tibia, instead of one, and these are placed one in each spinal groove along the line of junction of the spinous processes and the laminae, the periosteum having been previously reflected from these structures. The grafts are placed so that their periosteum is outermost. Albee's operation merely bridges the tip of the spinous processes with the graft. The value of smearing the line of graft with bone dust from the graft cutting is emphasized, as such dust plays an important part in the welding of the grafts to their beds in the spinal grooves. The grafts are cut by making drill holes at intervals of half to two-thirds of an inch, and splinting the bone with an osteotome along the line of holes. Twenty-eight cases are reported with 3 deaths in the series during ten years. Of the remaining 25 all but two are considered cured.—*Remarks on Bone Grafting as an Aid in Treatment of Tuberculous Spinal Caries, H. M. W. Gray, Brit. M. J., July 15, 1922, no. 3211, 73.*

Friedmann's Remedy.—The author gives detailed case reports extending over eight years of 32 cases of both pulmonary and glandular tuberculosis in which definite benefit and at times phenomenal cure were effected.—*Achtjährige Beobachtungen mit dem Friedmannschen Tuberkulosemittel aus hausärtzlicher Praxis, P. Kleemann, Ztschr. f. Tuberk., March 1922, xxxvi, 37.*

Treatment of Laryngeal Tuberculosis with Electric Cautery.—The local treatment of laryngeal tuberculosis has two purposes, one palliative and the other curative. The author deals only with the curative aspect of the question which he believes to be wholly in the domain of surgery. As the electric cautery will, in almost every instance, accomplish the same results as bloody surgery it is considered undoubtedly the method *par excellence* for the treatment of laryngeal tuberculosis. The disease is essentially a cellular infiltration with the formation of tubercles. This infiltration is avascular with rapid degeneration of the central cells. The beneficial action of the cautery is due more to the revitalization of the tissues through induced hyperemia than to the destructive action of heat. Experiments were done with guinea pigs in which it was shown that localized cutaneous lesions could be cured by proper cauterization. The development of granulation tissue and formation of new blood vessels following the sloughing of the eschar account for these good results. Hence, the object of treatment is not so much a destruction as a healing of the tubercle. All types, if within reach, are suitable for treatment. *Technique:* Cauterization should be done under local anesthesia, using powdered cocaine on a moist cotton applicator. As a rule, infiltration and swelling require ignipuncture, while ulceration should be seared with a broad knife. The proper treatment for infiltration of the various parts of the larynx is gone into at some length. Violent reactions are reported as absent and the postoperative soreness usually causes only a slight discomfort for the first twenty-four to forty-eight hours. Cauterization should not be repeated until the previous one has healed unless an entirely new area is to be treated. Benefit may occur within a week or ten days following treatment. Appropriate general treatment must not be neglected and the importance of vocal rest is recognized. The results claimed for this treatment are stated as extremely excellent. No case histories or other statistical evidence is given.—*The Use of the Electric Cautery in Laryngeal Tuberculosis, G. B. Wood, Amer. J. M. Sci., June 1922, clxiii, 854.*